

SIGNATURE

Service Manual



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SAFETY INSTRUCTIONS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

Safety Overview

- Read and follow **ALL SAFETY INSTRUCTIONS** in this manual and any warning/caution labels on the unit (decals, labels or laminated cards).
- Read and understand ALL applicable OSHA (Occupational Safety and Health Administration) safety regulations before operating this unit.

Recognition

Recognize Safety Alerts



This is the safety alert symbol. When you see it in this manual or on the unit, be alert to the potential of personal injury or damage to the unit.

Different Types of Alerts



DANGER:

Indicates an immediate hazardous situation which if not avoided **WILL** result in serious injury, death or equipment damage.



WARNING:

Indicates a potentially hazardous situation which, if not avoided, **COULD** result in serious injury, death, or equipment damage.



CAUTION:

Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury or equipment damage.

SAFETY TIPS

- Carefully read and follow all safety messages in this manual and safety signs on the unit.
- Keep safety signs in good condition and replace missing or damaged items.
- Learn how to operate the unit and how to use the controls properly.
- **Do not** let anyone operate the unit without proper training. This appliance is **not** intended for use by very young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.

- Keep your unit in proper working condition and do not allow unauthorized modifications to the unit.
-

QUALIFIED SERVICE PERSONNEL



WARNING:

Only trained and certified electrical, plumbing and refrigeration technicians should service this unit. **ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

SAFETY PRECAUTIONS

This unit has been specifically designed to provide protection against personal injury. To ensure continued protection observe the following:



WARNING:

Disconnect power to the unit before servicing following all lock out/tag out procedures established by the user. Verify all of the power is off to the unit before any work is performed.

Failure to disconnect the power could result in serious injury, death or equipment damage.



CAUTION:

Always be sure to keep area around the unit clean and free of clutter. Failure to keep this area clean may result in injury or equipment damage.

SHIPPING AND STORAGE



CAUTION:

Before shipping, storing, or relocating the unit, the unit must be sanitized and all sanitizing solution must be drained from the system. A freezing ambient environment will cause residual sanitizing solution or water remaining inside the unit to freeze resulting in damage to internal components.

MOUNTING ON A COUNTER

**WARNING:**

When installing the unit on a counter top, the counter must be able to support a weight in excess of 300 lbs. to insure adequate support for the unit.

FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

INTRODUCTION

MANUAL OVERVIEW

This manual is organized to allow the reader to scan quickly to the subject of interest along the left side of the pages and to read the detail about the subject or procedure on the right side of the page. The manual provides the detail needed for newcomers to the industry, while allowing experienced technicians to skip over the details and move quickly through the material.

This manual is designed as a guide for the trained technician in maintaining and servicing the Signature system. It is not meant for employees operating the equipment.

SYSTEM OVERVIEW

The Signature unit is a state-of-the-art Frozen Uncarbonated Beverage (FUB) unit. It provides improved drink availability, reliability and reduced complexity in a compact, reduced footprint unit.

The Signature unit also provides the highest quality drink appearance and consistency while keeping operation and maintenance simple and straightforward.

The Signature unit is simple in design and has built-in features and diagnostic controls to help the service technician quickly and accurately maintain and service the unit.

The unit consists of a freeze barrel that contains an internal auger driven by a magnetically coupled electric motor, a refrigeration system, a temperature-controlled, intelligent control system and interconnecting tubing and controls required to dispense the product.

CONTROL PANEL

A microprocessor based control system monitors and controls all of the major systems and components of the unit. Temperatures are monitored and managed by the control system to provide a consistently high quality product with optimal efficiency.

The control system is simple and straightforward to operate. In addition to controlling the unit, the control system keeps track of the diagnostic information for use when adjusting and/or repairing the unit.

The control system is accessed for the following situations:

- Installing the Signature unit
- Modifying Operating Characteristics
- Checking Performance
- Servicing/Repairing the unit
- Checking Error Messages

The control system is accessed using the control panel located along the top of the front panel. The control panel contains membrane buttons and LEDs as shown in Figure 1.

Control Panel Display

The Status LEDs on the right side of the panel are used for diagnostics and troubleshooting of the unit.

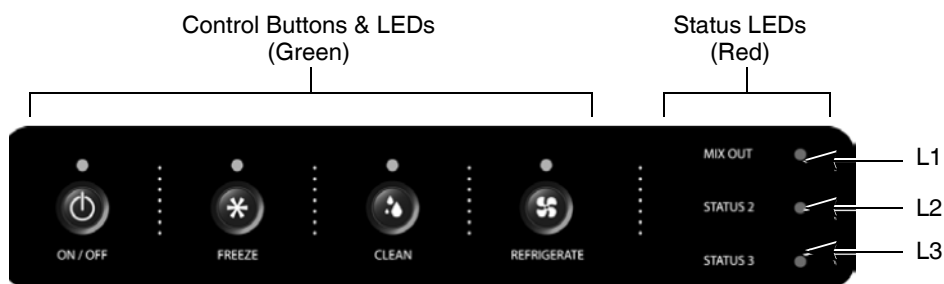


Figure 1. Control Panel Display.

CONTROL PANEL BUTTON DESCRIPTIONS

The following section describes the information displayed for each control panel setting and the interactions that are controlled by that setting.

The Signature control panel is a very simple design. It allows the operator to control the unit with the push of a button. Troubleshooting information on the unit is available from the three LEDs on the right side of the control panel.

The error conditions are described in Table 2 on page 9.

CONTROLS AND INDICATORS

ON/OFF Button

The ON/OFF Button toggles access between the operational modes and the programming/service modes. When the ON/OFF Button is pressed; the LED above the ON/OFF Button turns on, and the unit can then be placed into any of the 3 operational modes (Freeze, Clean, or Refrigerate). When the ON/OFF Button is pressed while the On/Off LED is on; the LED above the ON/OFF Button turns off and the unit can then be placed into either the programming or service mode.

This button does not turn off power to the unit.

FREEZE Button

During normal operation, the FREEZE Button controls the refrigeration system of the unit. When the FREEZE Button is On, the unit freezes the product barrel to the programmed viscosity setting and maintains the hopper at less than or equal to 41° F (5° C).

The FREEZE Button controls access to the Motor Type Selection Mode when the unit is in the Service Mode. Pressing the FREEZE Button repeatedly steps through the available motor types.

The FREEZE Button is also used in conjunction with the REFRIGERATE Button to place the unit into Programming Mode.

In the Programming Mode, repeatedly pressing the FREEZE Button steps through the coarse viscosity level settings for the product.

CLEAN Button

The CLEAN Button operates the Auger in the freeze barrel and the mixing Paddles in the Product Bowl on top of the unit. The auger and paddles are used to agitate the cleaning solution. Refrigeration is off in the Clean Mode.

The CLEAN Button and the REFRIGREATE Button are used together to place the unit into the Service Mode. The system defaults to the Motor Type Mode when the unit is placed in the Service Mode.

The Motor Calibration Mode is accessed from the Motor Type Mode by momentarily pressing the CLEAN Button.

In the Programming Mode, repeatedly pressing the CLEAN Button steps through the possible fine viscosity level settings for the product.

In the Component Remote Control Mode, the CLEAN Button is used as an on/off button for each selected load.

REFRIGERATE Button

The REFRIGERATE Button operates the unit in a temperature controlled mode. It keeps the Product Bowl and the Barrel at a chilled temperature, but the Barrel is in a liquid state, not frozen.

The REFRIGERATE Button is used in conjunction with the FREEZE Button to place the unit into the Programming Mode.

The CLEAN Button and the REFRIGREATE Button are used together to place the unit into Service Mode. In the Service Mode, pressing the REFRIGERATE Button places the unit in the Component Remote Control Mode.

In the Component Remote Control Mode the REFRIGERATE Button is used to select a load for testing. See "Component Remote Control" on page 31 for details on the operation of the unit in this mode.

PROGRAM SETTINGS

The Signature unit may be placed in a number of programming modes using a combination of buttons. These modes allow adjustment of viscosity, selection of motor type, calibration of a new motor, and they allow various components to be turned on and off for testing purposes.

The various programming modes are listed below with a description of their uses.

Programming Mode - This mode is accessed by pressing the FREEZE and REFRIGERATE Buttons simultaneously for more than 3 seconds when the unit is off. This allows the operator to adjust the coarse and fine viscosity settings to change product thickness for a variety of products. The unit defaults into the coarse viscosity indication when placed in Programming Mode.

These settings apply to product consistency in normal operation (Freeze Mode).

The consistency can be adjusted from watery to stiff, depending on the customer preference. The higher the number (1-3), the thicker the viscosity of the product.

In addition to the coarse settings adjusted through the FREEZE Button, there is a finer adjustment setting available by using the CLEAN Button. This has seven levels (1-7). The higher the number, the thicker the viscosity of the product.

Factory Mode - This mode (accessed by pressing and holding the CLEAN and REFRIGERATE Buttons simultaneously) allows the technician to select motor type, calibrate the barrel motor and manually control the loads in the system (motors, valves, compressor) for troubleshooting purposes.

Motor Type Mode - This mode is the default mode when the unit is placed in the Service Mode. Pressing the FREEZE Button repeatedly steps through the available motor types.

Motor Types	
Type 1 - 115VAC	Type 2 - 230VAC

Component Remote Control Mode - This mode (accessed by pressing the REFRIGERATE Button in the Service mode) allows the technician to independently start and stop various system components for testing purposes.

Motor Calibration Mode - This mode (accessed by momentarily pressing the CLEAN Button in the Service Mode) allows the technician to recalibrate a motor when some portion of the drive system is repaired or replaced.

Programming Mode

The Control Panel may also be used to program the unit for a variety of products and levels of viscosity. Table 1 describes the procedure for entering and leaving Programming Mode and the steps necessary to make the adjustments allowed.

Table 1.

Step	Procedure
1	The unit must be Off to enter the Programming Mode.
2	Press and hold the FREEZE and REFRIGERATE Buttons simultaneously. Hold for 3 seconds or until the FREEZE LED starts flashing.
3	The FREEZE LED continues to flash indicating Programming Mode
4	The coarse viscosity level of the product is indicated by the Status LEDs on the right side of the control panel. Refer to Figure 2 for LED display values. Repeatedly pressing the FREEZE Button steps through the viscosity settings (1-3).
5	Press the CLEAN Button, while the CLEAN LED is flashing. The fine viscosity level is now indicated by the Status LEDs at the right side of the control panel. Refer to Figure 2 for LED display values. Repeatedly pressing the CLEAN Button steps through the fine viscosity settings (1-7).

Table 1.

Step	Procedure
6	When selections are complete, press the ON/OFF Button. The four green LEDs should illuminate, indicating that the unit is no longer in the Programming Mode.
7	Press the ON/OFF Button once more to set the new viscosity settings into memory.
8	If this procedure is not followed, the new settings are not saved.
9	This completes the product viscosity setup procedure.

Status LEDs

The Status LEDs are located on the right side of the Control Panel, as shown in Figure 1. These LEDs are used to indicate various error conditions for the unit and the viscosity setting for the product in the unit.

When the unit is first placed into Freeze mode, the Status LEDs show the viscosity settings, as shown in Figure 2 (coarse for 1 second, then fine for 1 second). These codes indicate the viscosity of the product. (i.e., if the setting of the unit is level 1, 2 then the 1st LED flashes for 1 sec. and then the 2nd LED flashes for 1 sec.)

They are also used to program the unit for the viscosity desired. There are twenty one levels of viscosity (3 coarse settings and 7 fine settings) available for the Signature unit. Figure 2 shows how the three coarse and seven fine levels are displayed.

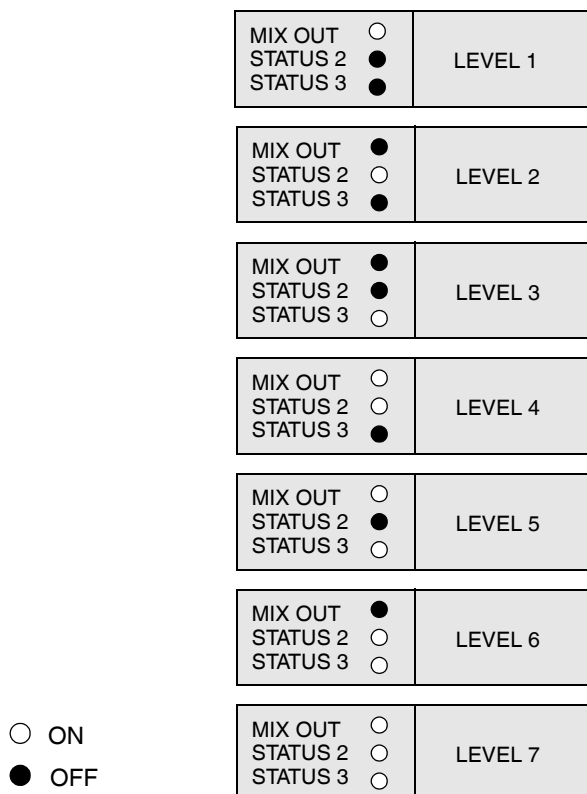


Figure 2. Viscosity Setting Displays

Error Conditions

Table 2 shows the possible system errors and a description of these errors. Figure 1 on page 5 shows the locations of the LED designations on the control panel.

NOTE: FL and a number indicates that the LED is flashing, L and a number indicates that the LED is continuously on.

Table 2.

Display Priority	Display Output	Error	Description
1	FL2 & FL3	Corrupted Data	Occurs when the system reads the user settings from EEPROM and it has become corrupted. The unit shuts down and the EEPROM must be reprogrammed.
2	L1, L2 & L3	Stuck Keypad	Occurs when any one of the keypad buttons is not functional anymore. This error can be detected at start-up or if a continuous key press is detected for more than 1 minute during any run mode.
3	L1 & FL3	Motor Calibration	Occurs only in the Service Mode when calibration value is outside the +/-10% window from the factory reference value. Once started, the calibration process requires 10 min. to complete. Any interruptions prevent the unit from performing a motor calibration. The user can clear the error from the front panel. (Press and Hold ON/OFF Button for 3 seconds).
4	FL1 & FL3	Barrel TCO	Occurs when any of the thermistors measure more than 120°F for 10 seconds and the unit is in either the REFRIGERATE or FREEZE Mode. It can only be cleared by power cycling the unit.
5	L1 & L3	Machine Disable	This error occurs when the faceplate switch is deactivated. Motor power is not available (also see next error). The unit is disabled until the faceplate is properly installed.
6	FL1 & L3	AC Relay Open	This error occurs when the motor controller does not detect voltage available for the motors but the faceplate is in place (can be refrigeration pressure switch or related circuit element). It can only be cleared by power cycling the unit.
7	FL1 & FL2	Hopper Refrigeration Error	This error is triggered when hopper temperature does not pull down in a specified time when in FREEZE or REFRIGERATE Mode. (Cut-in Temp + 13° F within 3 hrs.); it is assumed that the hopper evaporator is malfunctioning. (This error timer is not interrupted when the barrel takes refrigeration priority). The error timer is cleared when the hopper goes into IDLE state. The error itself can only be cleared by power cycling the unit.
8	L1 & L2	Barrel Refrigeration Error	This error is triggered when the barrel has been in FREEZE or REFRIGERATE Mode (viscosity not reached) for more than 40 min. Every handle activation (product dispense) resets the error timer. This error can only be cleared by power cycling the unit.
9	L3	Motor Drive	This error can be caused by two states: it can occur when the barrel motor command is on, but no motor current is detected, such as if the motor is disconnected. This case can be cleared from the front panel, which should be tried first (Turn unit OFF for 3 sec., then ON). However, it also occurs if the barrel motor is turned off but motor current is still detected; in this case, the error display will clear via the front panel, but reoccurs IMMEDIATELY. Unit must be power cycled to clear it.

Table 2.

Display Priority	Display Output	Error	Description
10	L2	Thermistor Error	This error is triggered when any of the 3 thermistors are detected open for more than 30 seconds. The error timer resets when all the thermistors read "normal". This error can only be cleared by power cycling the unit.
11	FL2	No Handle	Occurs when the handle is open for a period of 1 minute while the system is in Freeze or Refrigerate Mode. The error auto resets if the handle is detected again.
12	L2 & L3	Communication Error	This error occurs when no communication packets are detected for a period of 10 seconds. This error clears when communication is reestablished.
13	FL1, FL2 & FL3	Voltage Error	This error occurs when line voltage is above or below normal functional limits for more than 30 sec. (It can also be triggered when the wrong motor type is selected in Service mode.) Limits are determined based on nominal (115V /230V) line voltage +10% up and -15% down. Error can auto reset if voltage is reestablished within normal limits for at least 30 sec. User can clear the error from the front panel. by pressing and holding the ON/OFF Button for 3 seconds.
14	FL3	Motor Stall	This error occurs when the control board reports a stall condition on the motor. The error is detected when the unit is in any run mode. The error can be cleared from the front panel by pressing and holding the ON/OFF Button for 3 seconds.
15	FL1	No Product	No product is an error that can be detected only in mix out condition. Error is triggered if the dispense lever has been activated for a cumulative time of 2 min. This error prevents the user from accessing FREEZE or REFRIGERATE Mode because it is assumed that there is no more product in the barrel to be served. However, the user can access CLEAN Mode. The error automatically clears if the unit is in ON Mode and the hopper is refilled with product. This restores access to all unit modes.
16	L1	Low Product	This error occurs when low product level is detected in the hopper; the system goes into MIXOUT Mode. The error automatically clears if more product is added to the hopper.

OPERATION

STARTING THE UNIT

Table 3 describes the basic procedure for starting the Signature unit. Refer to the Operator's Manual (P/N 621058426OPR) for details on daily operation and operator maintenance of the unit.

Table 3.

Step	Action
1.	Remove the Bowl Cover Lid and fill the Product Bowl on top of the unit with product.
2.	Allow the barrel to fill with product and insert the air/mix tube into the bowl (if dairy product is being used).
3.	Press the ON/OFF Button on the control panel to activate the control panel.
4.	Press the FREEZE Button to start chilling the product in the unit. The unit automatically starts to chill down the product in the barrel and the mixing blades in the Product Bowl on top of the unit start to spin.
5.	Wait 10 to 15 minutes or until the Freeze LED stops flashing before dispensing the product.
6.	Product is ready to serve from the barrel, however, the unit continues to run until the temperature of the Product Bowl is satisfied.

PREVENTATIVE MAINTENANCE

SUMMARY

Normal equipment maintenance procedures and intervals are listed in Table 4. It is recommended that preventative maintenance procedures be performed every six (6) months. This procedure should include all of the maintenance items described in Table 4 and the following sections.

Table 4.

Preventative Maintenance Summary	
Maintenance Procedure	Frequency of Maintenance
Sanitize Unit	Daily (especially w/dairy products)
Clean Air Filter	Monthly or more often, as necessary (See Table 13)
Clean Condenser Coil	Every six months or as necessary
Change Scraper Blades	Every six months
Check for Leaks	Every six months



CAUTION:

Only trained and certified electrical, plumbing and refrigeration technicians should service this unit. ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES.

DAILY MAINTENANCE

On a daily basis, clean all external surfaces with a mild soap solution and rinse with potable water. Dry all external surfaces with a clean soft cloth.



CAUTION:

Avoid the use of abrasive cleaners and chlorine based solutions, which can damage the finish. If desired, small parts may be cleaned in a dishwasher.

Cleaning and Sanitizing Procedure

Under normal operating conditions, the unit must be sanitized on a daily basis, specially if dairy products are being used in the unit.

Supplies





Warm water, house hold dish washing detergent [3.0 oz. (89 ml) in 3.0 gallons (11.4 liters) of warm water solution at 90-100°F (32-38°C)] or KAY-5 sanitizer (100ppm).

Tools

Draining bucket, brushes, magnet removal tool, spray bottle for sanitizer and food grade lubricant.

Draining the Unit

Table 5.

Step	Procedure
1	Press ON/OFF  Button to turn off the unit. NOTE: It is recommended that you shut the unit off as far ahead of cleaning as possible to allow the product in the barrel to thaw for easier removal.
2	NOTE: Air tube and blade sweepers are only used for dairy products. Remove the Bowl Lid Cover and Air Tube. Place the Air Tube in a parts bin to be cleaned later. Replace the Bowl Lid Cover. See Figure 3.
3	Press the ON/OFF  Button to turn the unit ON and push the CLEAN  Button.
4	Place an empty bucket under the Product Dispense Valve and move dispense handle to the right (open position, shown in Figure 4) and drain as much liquid as possible. Allow the last of the product to drain, then close the dispenser valve by turning the dispense handle all the way to the left. Press ON/OFF  Button to turn OFF the unit.
5	NOTE: Skip this step if the unit does not have the 2 for 1 feature. Place the bucket under the 2 for 1 Dispense Nozzle, pull the handle and allow the product to drain until the line is empty, see Figure 5.

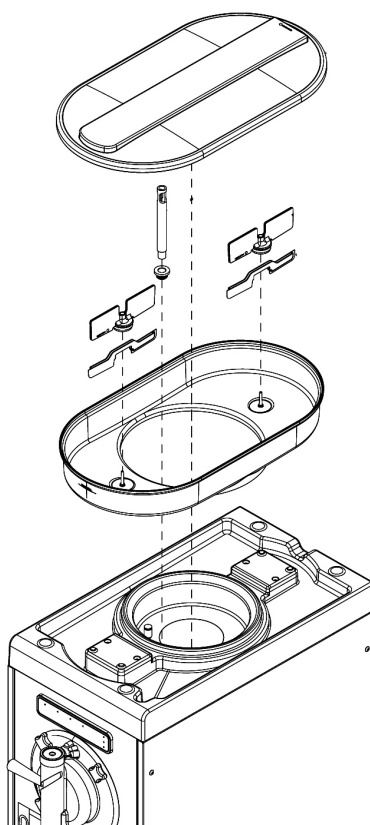


Figure 3.

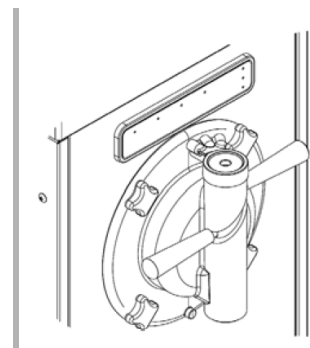


Figure 4.

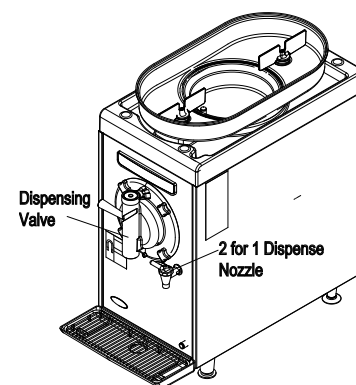





Figure 5.




Rinsing the Unit

Table 6.

Step	Procedure
1	Remove Bowl Lid Cover and fill the Product Bowl with 3.0 gallons or (11.4 liters) of warm [(90-100° F) (32-38° C)] potable water and replace the Bowl Lid Cover.
2	Press the ON/OFF  Button to turn the unit ON and then press the Clean  Button. Allow to run for 30 seconds.
3	Place an empty bucket beneath the product Dispensing Valve and move the handle to the right (open position) and drain all the rinse water from the barrel and bowl. Close the Dispensing Valve by turning the handle all the way to the left.
4	NOTE: Skip this step if the unit does not have the 2 for 1 feature. Place the bucket beneath the 2 for 1 Dispense Nozzle and pull up the handle to the open position. Drain liquid until water stops flowing in the 2 for 1 line.
5	Press ON/OFF  Button to turn Off the unit.
6	Repeat step 1-5 again or until water running through Dispense Valve is clear.

Detergent Wash and Clean the Unit

Table 7.

Step	Procedure
1	Remove Bowl Lid Cover.
2	Prepare detergent water by mixing 3.0 oz. (89 ml) of a dish washing detergent in 3.0 gallons (11.4 liters) of 90 to 100° F (32 to 38° C) warm water.
3	Pour the detergent solution into the Product Bowl.
4	Use supplied brush to gently scrub inner surface of the barrel fill tube and inside of Product Bowl Evaporator, as shown in Figure 6.
5	NOTE: Skip this step if the unit does not have the 2 for 1 feature. Place bucket under 2 for 1 Dispense Nozzle, pull handle and allow the product to drain until detergent solution exits the nozzle.
6	Replace the Bowl Lid Cover then press the ON/OFF  Button to turn the unit ON and then push the Clean  Button. Allow to agitate for 10 minutes. (Note: Unit automatically exits the Clean Mode after 10 minutes.)
7	Place an empty bucket under the dispenser and drain as much liquid as possible. Press the ON/OFF  Button to turn OFF the unit.
8	NOTE: Skip this step if the unit does not have the 2 for 1 feature. Place the bucket beneath the 2 for 1 Dispense Nozzle and pull up handle to open position. Drain liquid until detergent stops flowing in the 2 for 1 line.
9	Pour small amount of detergent into the drip tray to flush and clean the drain tube, shown in Figure 7.

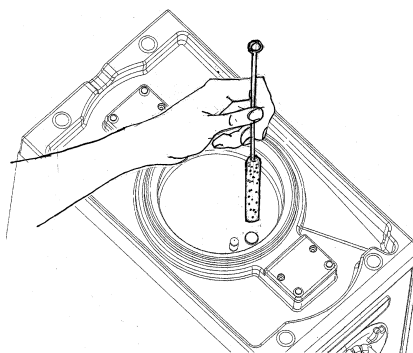


Figure 6.

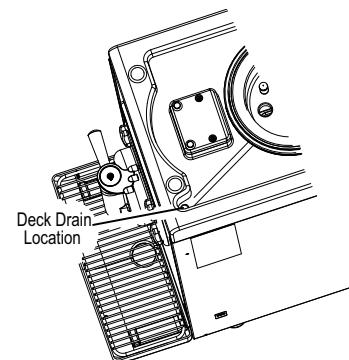


Figure 7.

System Disassembly



CAUTION:
Make sure the unit is Off before disassembly.

Place all disassembled components in a parts bin to be cleaned later in the sink or in a dishwasher and perform the procedure in Table 8.

Table 8.

Step	Procedure
1	Remove the Bowl Lid Cover the Mixing Blades and Blade Sweepers from the Product Bowl, as shown in Figure 8. (Also remove the air tube and blade sweepers, if using dairy products.)
2	Remove the Product Bowl from the unit.
3	Turn the Product Bowl upside down and remove the Bowl Gasket, as shown in Figure 9.
4	Remove the Dispense Handle from the Plunger, by pulling it straight out of the Plunger. Figure 11.
5	Remove the Faceplate from the front panel by unscrewing the four (4) Thumb Knobs. See Figure 11.
6	Remove the Plunger from the Faceplate by pulling it out the top of the Faceplate. See Figure 11.
7	Carefully remove the two (2) O-Rings from their grooves and slide them to the narrow area of the Plunger. See Figure 10. TIP: Use a paper towel to squeeze the O-Ring on opposite sides. This makes it easier for you to grab the O-Ring.
8	Remove the Faceplate Gasket from the rear of the Faceplate, as shown in Figure 12.
9	Remove the Auger assembly while holding the Scraper Blades in place, as shown in Figure 14.
10	Use the Magnet Removal Tool to remove the Auger Drive Magnet. Place the bar handle against the lip of the barrel and hook the wire form into the hole in the magnet coupling. Pull the end of the magnet removal tool handle towards you until the magnet is disconnected. See Figure 13. CAUTION: Be extremely careful when handling the magnet set. Do not place the magnet near small metal objects.
11	To remove Drive Magnet Coupling and Bearing press the magnet, coupling side down on a table or other hard surface. The bearing and coupling will slide out. See Figure 15.
12	Remove the Drip Tray and Cup Rest from the unit, as shown in Figure 16.

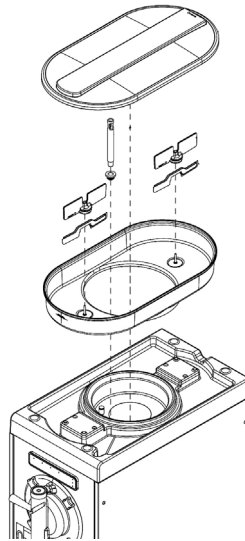


Figure 8.

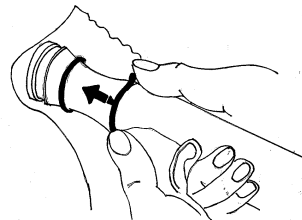


Figure 10.

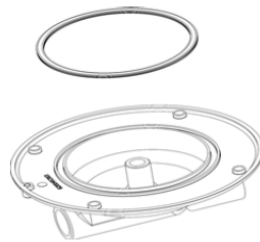


Figure 12.

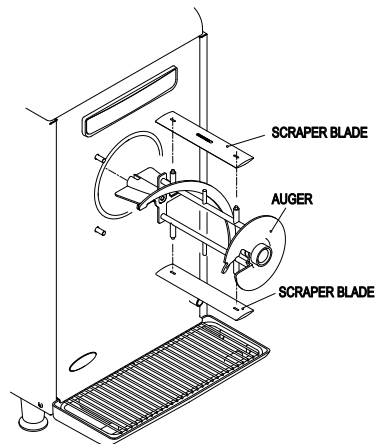


Figure 14.

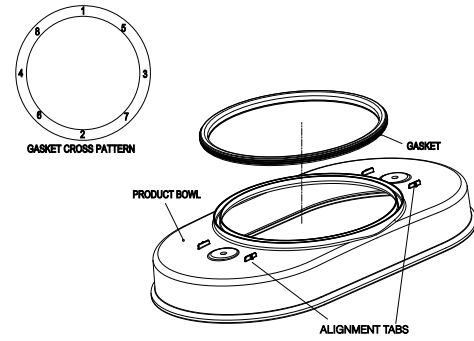


Figure 9.

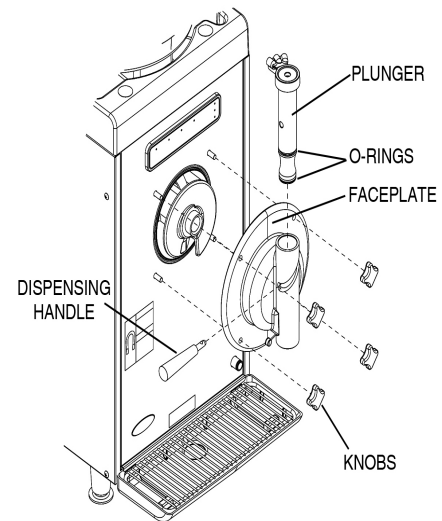


Figure 11.

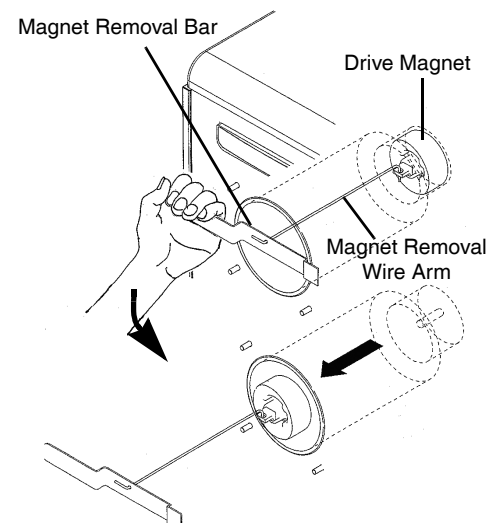
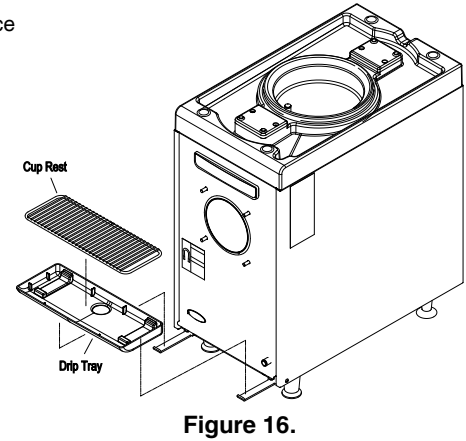
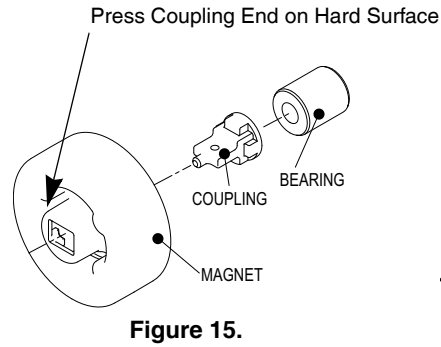


Figure 13.



System Cleaning

Make sure all removable parts that make contact with the food product are removed from the unit and that all brushes provided with the unit are available for cleaning.



CAUTION:

Avoid the use of abrasive cleaners, which can damage the finish. If desired, these pieces may be cleaned in a dishwasher.

Table 9.

Step	Procedure
1	Prepare detergent solution by mixing 3.0 oz. (89 ml) of dish washing detergent in 3.0 gallons (11.4 liters) of 90 to 100° F (32 to 38° C) warm water.
2	Place all parts in detergent solution and thoroughly wash each part that has been removed in System Disassembly and the Air Tube . Thoroughly brush clean all disassembled parts in the detergent solution. Make sure ALL lubrication and product film is removed from all parts. If parts are excessively coated, wipe clean with a paper towel to remove excess product and/or lubricant. See Figure 17.
3	Rinse all parts thoroughly with clean warm [90-100° F (32-38° C)] water.
4	Using a clean brush with the same dish washing soap solution, wipe out all surfaces of the barrel interior and the front surface of the unit, as well as the top surface of the unit under the Product Bowl. See Figure 17 and Figure 18.
5	Thoroughly rinse these surfaces with a clean cloth and clean warm [90-100° F (32-38° C)] water.
6	Allow all the parts and the unit to dry.

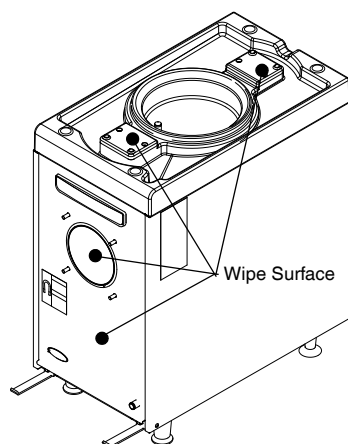


Figure 17.

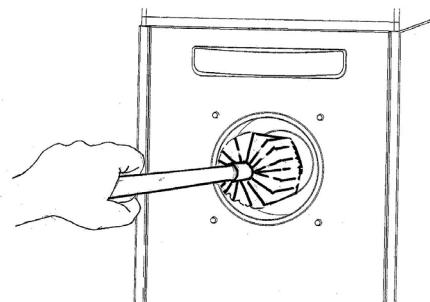


Figure 18.

System Assembly

Once the unit and all components have been cleaned and dried, reassemble the unit by performing the procedure in Table 10.



CAUTION:

Make sure unit is OFF before assembly.

IMPORTANT: It is very critical to assemble the unit with clean, sanitized hands or wearing a new pair of rubber gloves.



CAUTION:

Carefully lubricate o-rings with a small amount of Dow Corning 111 Valve Lubricant and Sealant. Be careful not to tear or cut the O-rings. This might cause the product to leak from the faceplate of dispenser.

Table 10.


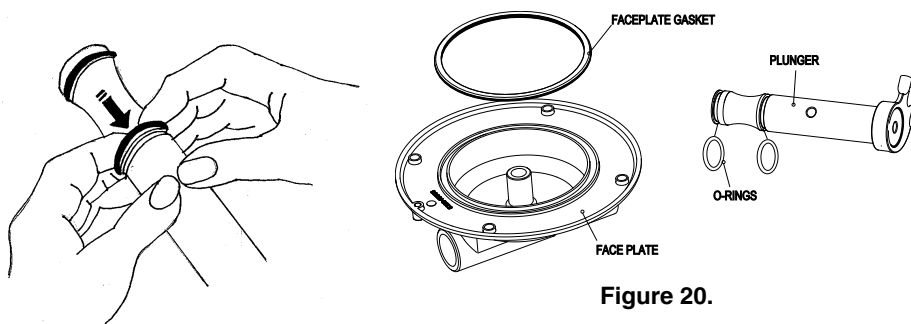
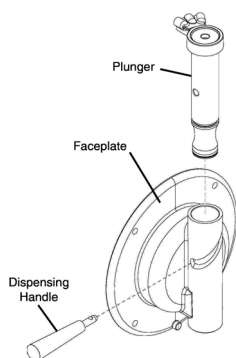
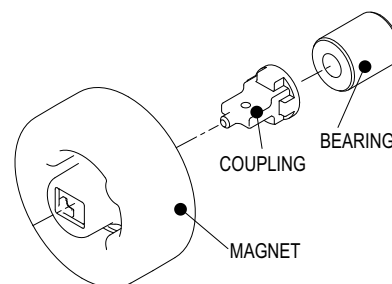
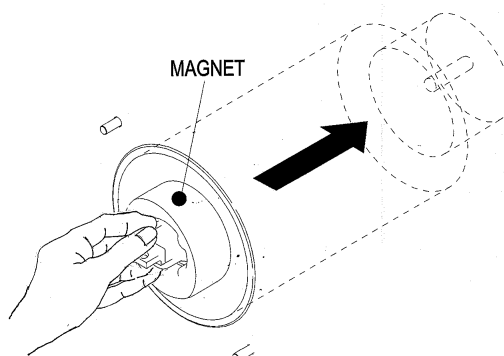
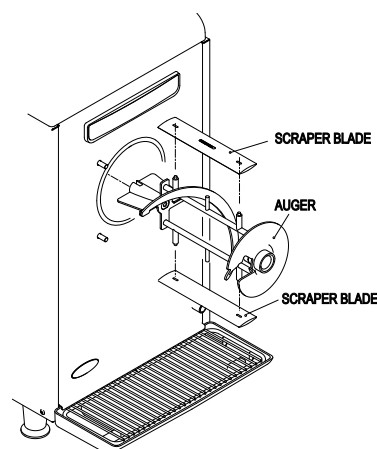
Step	Procedure
1	Place the O-Rings back into their grooves on the Plunger. Lightly lubricate the exposed surfaces. See Figure 19.
2	Reinstall the Faceplate Gasket into the groove on the back of the Faceplate. Make sure the gasket is flat and not twisted. See Figure 20.
3	Replace the Plunger assembly into the Faceplate and align it so the Handle can be inserted into the Plunger through the Faceplate, as shown in Figure 21. Push in and rotate the Handle until it snaps into place.
4	Reassemble the Auger Drive Magnet by pressing the Coupling and Bearing into the rear of the magnet. When properly assembled the bearing is flush with the back of the magnet. See Figure 22.  CAUTION: Do not use the magnet removal tool to install the magnet manually.
5	Carefully replace the Auger Drive Magnet into the barrel. When the magnet approaches the rear of the barrel, the magnetic force pulls it to the center at the rear end of the barrel. Release it from your fingers. See Figure 23.
6	Assemble the Scraper Blades on the Auger and insert it into the barrel while holding the Scraper Blades in place. Push gently and spin the Auger until it engages the magnet. The Scraper Blades are 1/8" inside the barrel when coupled correctly. See Figure 24.
7	Center the Faceplate with the Auger Bearing and push it into position on the four mounting studs, as shown in Figure 25 and replace the four (4) faceplate Hand Nuts. Make sure they are tightened in a cross pattern (upper left, lower right, upper right then lower left.).

Table 10.

Step	Procedure
8	Turn the Product Bowl upside down and replace the Bowl Gasket using a cross pattern (as shown in Figure 26) to make sure that the gasket does not leak.
9	Replace the Product Bowl on the unit. Gently slide the bowl over the evaporator, as shown in Figure 27. Make sure the alignment tabs on the bottom of the Product Bowl are aligned with the motor covers on top of the unit.
10	Replace the Mixing Blades and Blade Sweepers (for dairy products) into the Product Bowl and place the Bowl Lid Cover onto the Product Bowl.
11	Replace the Drip Tray and Cup Rest, as shown in Figure 28.
12	Turn the Dispense Handle to the left to close the valve.
13	The unit is now ready to be sanitized.


Figure 19.

Figure 21.

Figure 22.

Figure 23.

Figure 24.

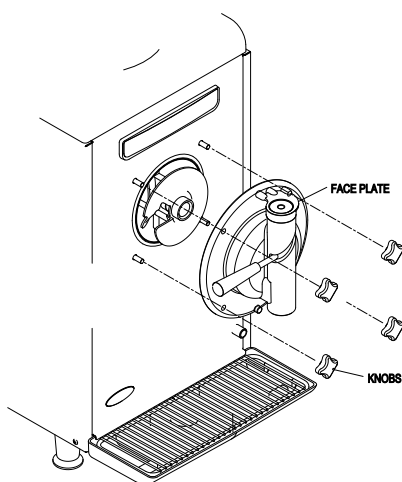


Figure 25.

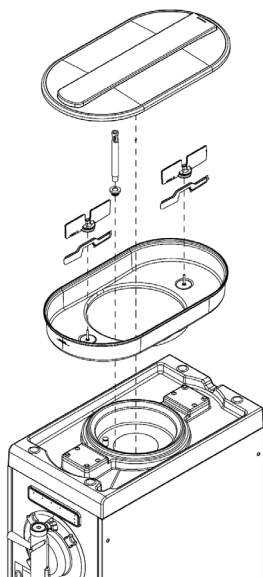


Figure 27.

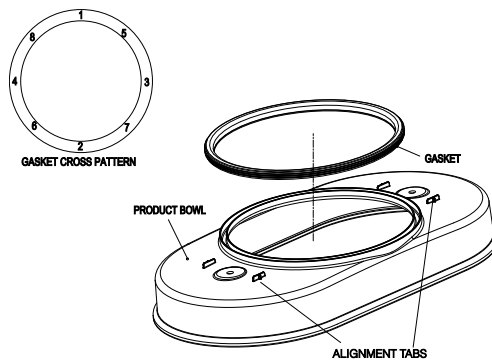


Figure 26.

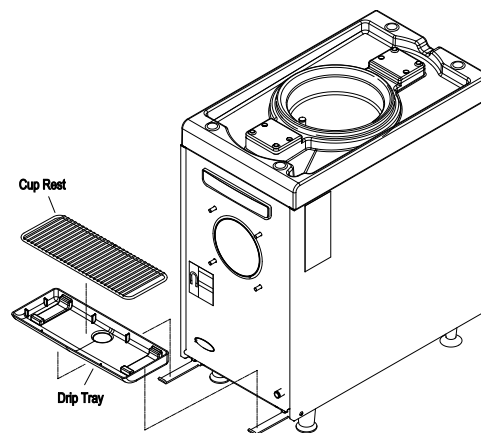


Figure 28.

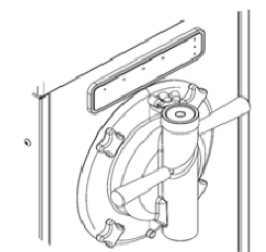


Figure 29.

System Sanitation







Kay-5 Sanitizing Solution. Dissolve one packet of Kay-5 Sanitizer/Cleaner into 2-1/2 gallons of warm water to insure 100ppm of available chlorine. Always use freshly prepared chlorine solution. Use sanitation chemicals only in accordance to manufacturer's instructions. To sanitize the unit, perform the procedure in Table 11.

IMPORTANT: Follow label directions on cleaning solution.

Table 11.

Step	Procedure
1	Remove the Bowl Lid Cover.
2	Fill a spray bottle with prepared sanitizer.
3	Turn Bowl Lid Cover upside down and spray sanitizer over entire surface of Bowl Lid Cover enough to coat the entire cover.
4	Submerge Air Tube (Only used for dairy product) into sanitizer bucket for 2 minutes. Remove and set aside until final rinse is complete.

Table 11.

Step	Procedure
5	Pour remaining prepared sanitizer in Product Bowl of unit.
6	NOTE: Skip this step if the unit does not have the 2 for 1 feature. Place a bucket under 2 for 1 Dispense Nozzle and allow product to drain until sanitizer solution exits valve.
7	Spray the lip and the top half of the Product Bowl with sanitizer. Replace the Bowl Lid Cover on the Product Bowl, then press the ON/OFF  Button to turn the unit ON and push the CLEAN  Button. The unit automatically exits Clean Mode in 10 minutes.
8	Place an empty bucket under the Dispensing Valve and drain as much of the sanitizer as possible while Auger is on. Press the ON/OFF  Button to turn OFF the unit.
9	NOTE: Skip this step if the unit does not have the 2 for 1 feature. Place a bucket under 2 for 1 Dispense Nozzle, pull handle and allow product to drain until sanitizer solution exits the valve.
10	Remove the Bowl Lid Cover.
11	Using a clean bucket, pour 3.0 gallons (11.4 liters) of potable water into the Product Bowl.
12	Replace the Bowl Lid Cover then press the ON/OFF  Button to turn the unit ON and push the CLEAN  Button. Allow to agitate for 2 minutes.
13	Place an empty bucket under the Dispensing Valve and drain all of the water while Auger is on. Press the ON/OFF  Button to turn OFF the unit.
14	NOTE: Skip this step if the unit does not have the 2 for 1 feature. Place bucket under 2 for 1 Dispense Nozzle, pull handle and allow the product to drain until the unit is empty.
15	Turn Dispense Handle to the left to (Closed position, see Figure 29).
16	Remove the Bowl Lid Cover and load product.
17	If running dairy product, replace the Air Tube.
18	Replace the Bowl Lid Cover and draw an 8 oz. drink and dispose of it before serving product.

Cleaning Parts Inventory List

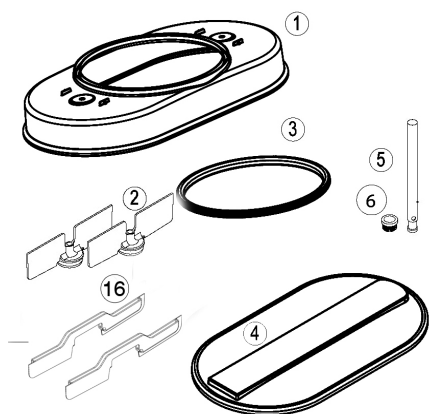
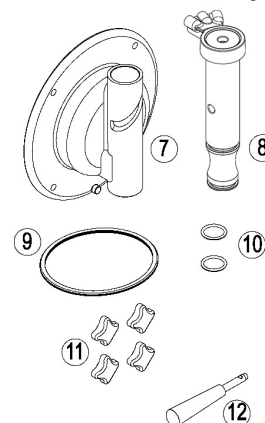
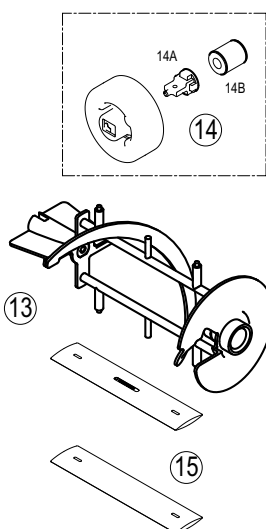
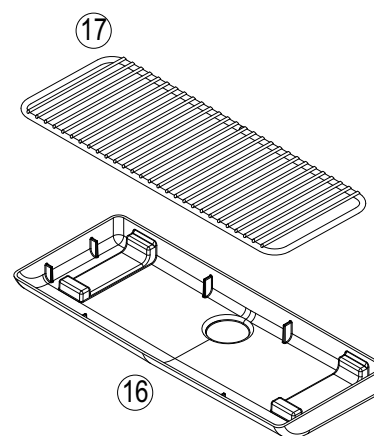
The following is a list of parts that need to be cleaned so that the unit is sanitized completely.

Table 12.

Item	Part Number	Description	Qty.
1	620049756	Product Bowl	1
2	620043194	Mixing Blade	2
3.	620049757	Gasket, Evaporator	1
4	620049940	Cover	1
5	620049969	Air Tube	1
6	620047121	Air Tube Seal	1
7	620045393	Face Plate	1
8	620045394	Plunger	1
9	620047115	Faceplate Gasket	1

Table 12.

Item	Part Number	Description	Qty.
10	620054997	O-Ring	2
11	620042994	Knob	4
12	620043383	Handle Dispensing	1
13	620047944	Auger	1
14	620049764	Drive Magnet Assembly	1
14A	620046135	Coupling	1
14B	560004289	Bearing	1
15	620043012	Scraper Blade	2
16	620050276	Blade Sweeper	2
17	620048449	Drip Tray	1
18	620716516	Cup Rest	1

Product Bowl Assembly**Face Plate Assembly****Auger Assembly****Drip Tray Assembly**

MONTHLY MAINTENANCE

Perform a general inspection of the unit for leaks and cleanliness on a weekly basis. Any abnormal conditions should be reported and corrected when noticed.

Refer to Table 4 and the following procedures for a listing of the monthly maintenance items. These procedures help to insure proper operation of the unit on a long term basis.

Cleaning the Air Filter

The air filter should be cleaned at least once a month (more often in harsh environments). Perform the procedure in Table 13 to clean the air cleaner.

Table 13.

Step	Procedure
1.	Turn off the unit.
2.	Reach under the unit and flip up the filter retaining bar, shown in Figure 30.
3.	Remove the filter by grasping it and sliding it toward the front of the unit.
4.	Carefully wash filter with clean water. Shake out excess water and towel dry filter.
5.	Set the filter into the filter holding bracket toward the rear of the unit and flip down the filter retaining bar to hold the air filter in place, as shown in Figure 31.
6.	Turn on the unit.

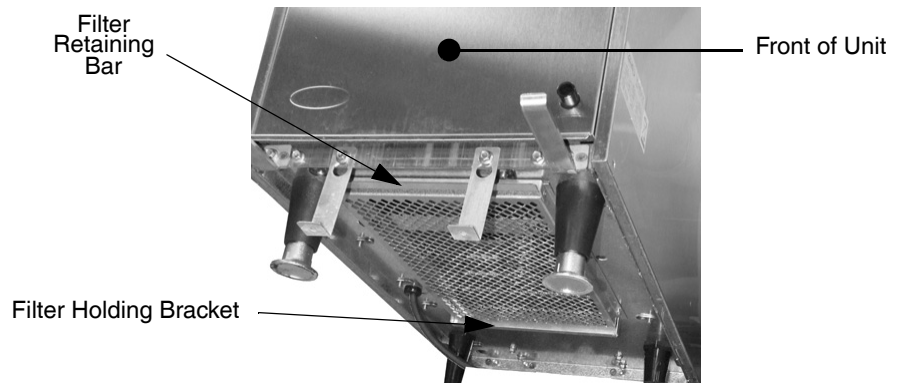


Figure 30. Air Filter Location

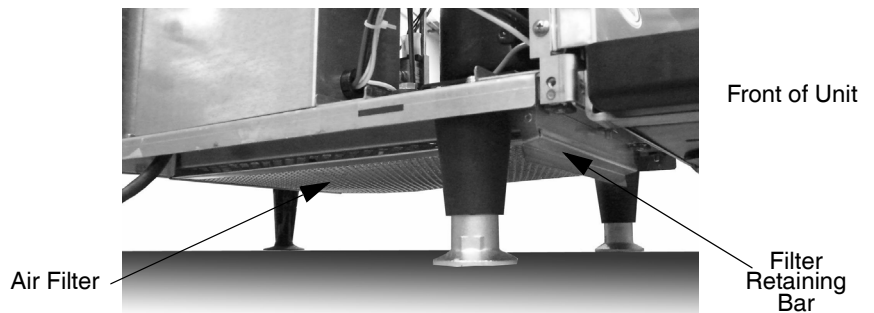


Figure 31. Air Filter Installation

SEMI-ANNUAL MAINTENANCE

There are several procedures that should be completed on a semi-annual basis. These procedures help to insure proper operation of the system on a long term

basis. Refer to Table 4 and the following procedures for a listing of the semi-annual maintenance items.

Inspecting and Replacing Scraper Blades

Scraper blades should be inspected for wear during the semi-annual maintenance check. To inspect the blades, perform the procedure in Table 14.

Table 14.

Step	Procedure
1	Perform the procedure in Table 5 on page 13 to drain the unit.
2	Remove the Barrel Faceplate from the front panel by unscrewing the four (4) Thumb Knobs. See Figure 11 on page 16.
3	Remove the Auger assembly while holding the Scraper Blades in place, as shown in Figure 14 on page 16
4	Wipe out the barrel with a clean, damp, soft cloth.
5	Inspect the Scraper Blades for wear and replace if necessary.
6	Assemble the Scraper Blades on the auger and insert it into the barrel while holding the scraper blades in place. Push gently and spin the auger until it engages magnet. The scraper blades will be 1/8" inside the barrel when coupled correctly. See Figure 11 on page 16
7	Center the Faceplate with the auger bearing and push it into position on the four mounting studs, as shown in Figure 11 on page 16
8	Replace the four (4) Faceplate Hand Nuts. Make sure they are tightened in a cross pattern (upper left, lower right, upper right then lower left.) and snug up all the nuts before you finish tightening them.
9	Clean and sanitize the unit, if needed, as shown in the Cleaning and Sanitizing Procedure on page 12. Otherwise, refill with product and serve.

COMPONENT REPLACEMENT

The following procedures should be followed to service the Signature unit. Testing and troubleshooting is aided by using the control buttons and the LEDs located on the front panel of the unit. These buttons are used in a variety of ways to control the functions of the unit. Refer to the “Control Panel Button Descriptions” on page 5 of this manual for details on the functionality of the various buttons on the control panel and the patterns of the LEDs.

The Service Mode is used to perform the procedures contained in this section.



WARNING:

Disconnect power to the unit before servicing. Follow all lock out/tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

Motor Type Selection

Service Mode is used to select motor type, calibrate the barrel motor and to manually control the loads in the system (motors, valves, compressor).

To enter the Service Mode, press and hold the CLEAN and REFRIGERATE Buttons simultaneously for more than 10 seconds. When the unit enters the Service Mode, the ON/OFF LED blinks at 1 sec. intervals. The unit defaults to the Motor Type Selection Mode.

The Motor Type Selection Mode is used to select the correct motor type for the motor used or replaced in the unit. The control setting is required to properly calibrate a motor assembly.

To access the Motor Type Selection Mode, press and release the FREEZE Button. When the unit enters the Motor Type Selection Mode, the FREEZE LED blinks at 1 sec. intervals.

Select the Motor Type by repeatedly pressing the FREEZE Button in accordance with the listing in Table 15 and Figure 35.

NOTE: The correct operation of the unit depends entirely on the proper motor type selection. A motor type mismatch leads to incorrect barrel viscosity detection or a false voltage error.

Table 15.

Motor Type	Description
Type 1	Bison 120V/60 Hz. Integrated Gear Box Transmission
Type 2	Bison 230V/50 Hz. Integrated Gear Box Transmission

MIX OUT	○	Motor Type 1
STATUS 2	●	
STATUS 3	●	
MIX OUT	●	Motor Type 2
STATUS 2	○	
STATUS 3	●	
MIX OUT	●	Motor Type 3
STATUS 2	●	
STATUS 3	○	
MIX OUT	○	Motor Type 4
STATUS 2	○	
STATUS 3	●	
MIX OUT	○	Motor Type 5
STATUS 2	●	
STATUS 3	○	
MIX OUT	●	Motor Type 6
STATUS 2	○	
STATUS 3	○	
MIX OUT	○	Motor Type 7
STATUS 2	○	
STATUS 3	○	

○ ON
● OFF

Figure 35. Motor Type Displays

CONTROL BOARD REPLACEMENT



WARNING:

Disconnect power to the unit before servicing. Follow all lock out/tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

When replacing or testing electronic components, be sure to wear a static strap connected to chassis ground. This protects the electronic components from any static discharge while working on the unit.

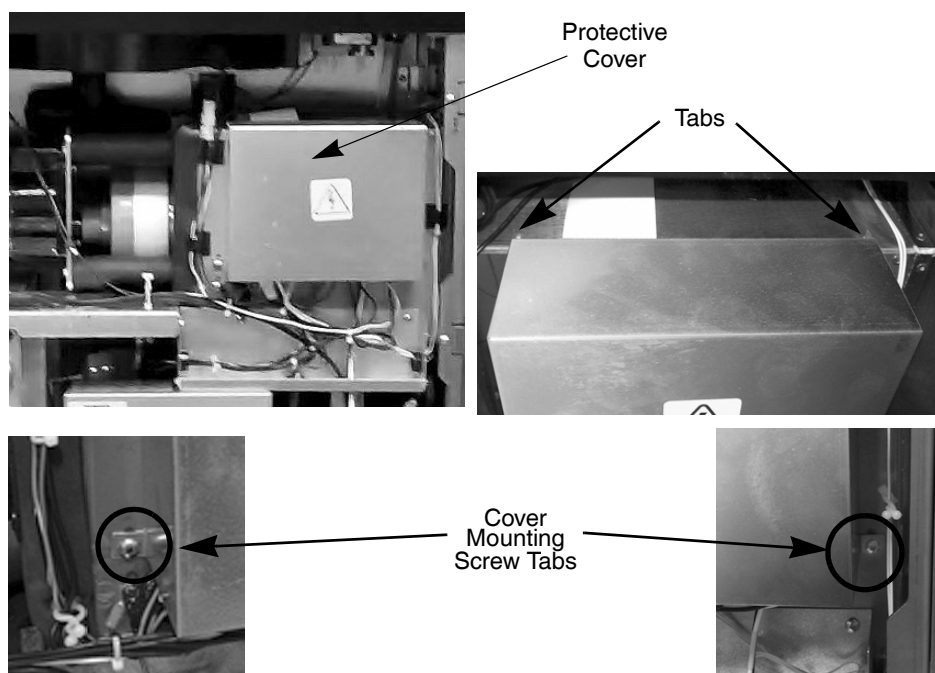
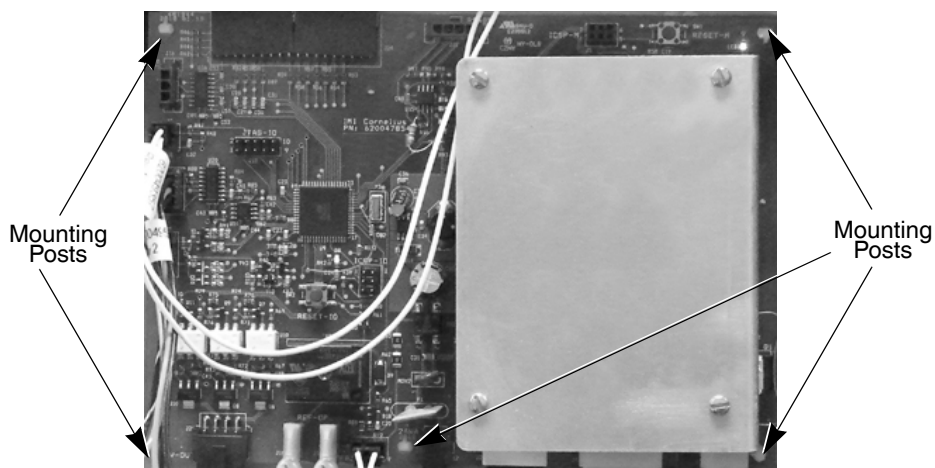
The Control board is located on the left side of the unit. It is mounted to a panel on five (5) plastic mounting posts, shown in Figure 37. To replace the control board, perform the procedure in Table 16.

Table 16.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the left side panel from the unit.
3	Connect a static strap to your wrist and any convenient chassis ground on the unit.

Table 16.

Step	Procedure
4	Remove the cover from the Control Board by loosening the mounting screws from each side of the cover and lifting cover off the two tabs at the top, as shown in Figure 36.
5	Unplug all of the connectors from the board.
6	Pop the board off the mounting posts. (See Figure 37.)
7	Replace the board.
8	Reconnect all of the connectors to the control board.
9	Remount the protective cover over the control board.
10	Replace the side panel.
11	Reconnect power to the unit.


Figure 36. Control Board Protective Cover

Figure 37. View of Control Board

BARREL MOTOR ASSEMBLY REPLACEMENT



WARNING:

Disconnect power to the unit before servicing. Follow all lock out/tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

The barrel motor assembly consists of the motor and magnet assembly. If this assembly must be replaced, refer to Figure 38 for the location of the mounting bolts and perform the procedure in Table 17 to replace the motor assembly.

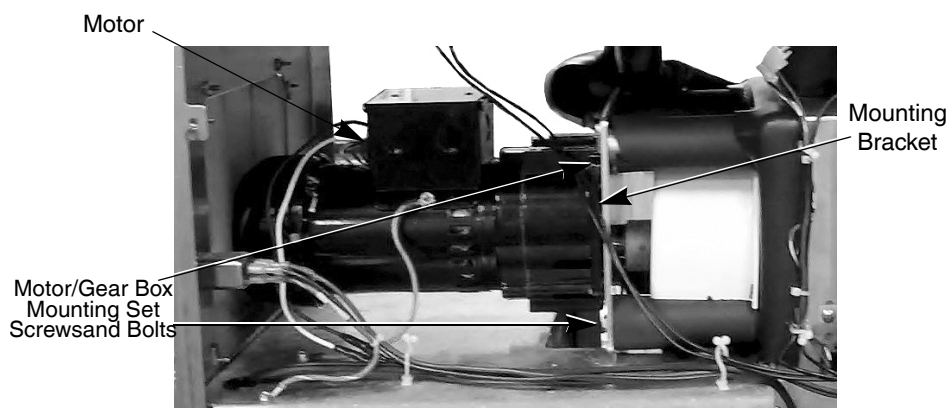


Figure 38. Motor Mounting, Right Side



Figure 39. Rear Motor Access Panel

Table 17.

Step	Procedure
1	Disconnect power from the unit.
2	Remove internal magnet, if installed.
3	Remove the side panels and the rear access panel from the unit. (See Figure 39.)
4	On the left side of the unit, remove the Control Board cover by loosening the mounting screws, from each side of the cover and lifting the cover off the two tabs at the top, as shown in Figure 36 on page 27.
5	Disconnect the motor connector from the control board, as shown in Figure 40.
6	Remove the motor wiring from the wiring clips.
7	Remove the nuts from the left and right mounting set screws securing the motor/magnet assembly to the mounting bracket, as shown in Figure 38 on page 28.
8	Pull the motor/magnet assembly out the rear of the unit.
9	Remove the bolt from the center front of the magnet, as shown in Figure 41.
10	Loosen the set screw on the side of the magnet collar, as shown in Figure 42.
11	Remove the magnet from the motor shaft.
12	Remove the four (4) mounting bolts and bracket from the motor, as shown in Figure 43.
13	Mount the new motor on the bracket using the four (4) 1/4-28 bolts and torque to 94 in-lbs.
14	Mount the magnet on the motor shaft and tighten the 1/4-20 bolt in the center of the magnet to 75 in-lbs. (See Figure 41.)
15	Tighten the set screw on the side of the magnet collar, as shown in Figure 42.
16	Reroute the motor wiring using the wiring clips provided.
17	Replace the motor/magnet assembly into the unit through the rear motor access panel.
18	Reconnect the motor connector to the PCB and replace the Control Board cover.
19	Finish tightening the motor mounting nuts completely. Tighten to 75 in-lbs.
20	Replace the motor access panel at the rear of the unit.
21	Reinstall the side panels onto the unit.
22	Reconnect power to the unit.
23	Verify that the system is set to the correct motor type.
24	Perform the "Motor Calibration" on page 30.

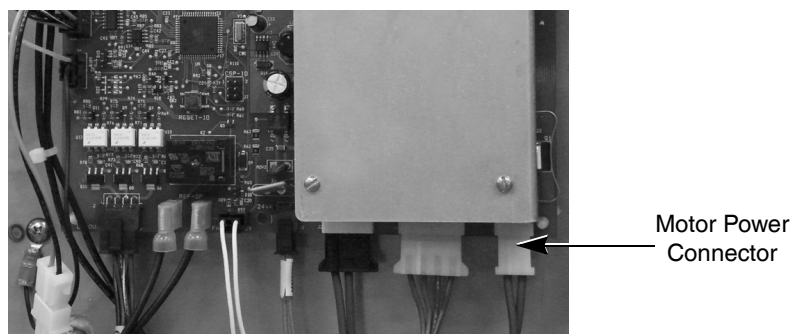

Figure 40. Control Board Power Connector



Figure 41. Magnet Mounting Bolt



Figure 42. Magnet Set Screw Location

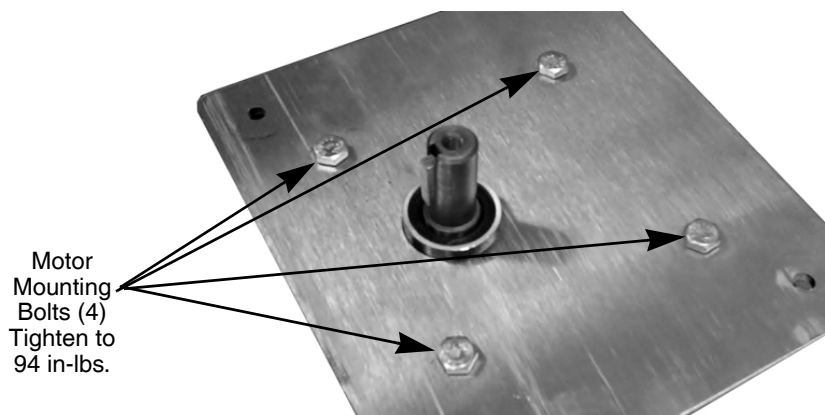


Figure 43. Motor Mounting Bracket

Motor Calibration

Motor calibration is required whenever a motor or any components in the barrel drive system are replaced or magnetic drive components are replaced. Perform the procedure in Table 18 to calibrate the drive system.

Table 18.

Step	Procedure
1	Fill the barrel with potable water.

Table 18.

Step	Procedure
2	From the Service Mode, momentarily press the CLEAN Button. This places the unit in the Motor Calibration Mode, as indicated by the CLEAN LED blinking at 1 sec. intervals and the Mix Out LED flashing at a rate of 1 sec. on and 1/2 sec. off. This indicates that the unit is ready for motor calibration.
3	Pressing the CLEAN Button a second time starts the calibration process. During the automated calibration process, the Mix Out LED is illuminated.
4	Once the automated calibration process is started, it should be allowed to complete. The calibration process times out in 10 minutes. Successful motor calibration is indicated by the Status 2 LED flashing. If the calibration process is unsuccessful, the Status 3 LED flashes.

NOTE: If calibration is not successful, check the motor, auger, magnet, scraper or bearing for interference or misalignment.

Component Remote Control

This mode is accessed from the Service Mode by momentarily pressing the REFRIGERATE Button. The purpose of the Remote Control Mode is to allow the technician to independently start and stop various system components for test purposes. While in the Remote Control Mode, the technician can manually turn various unit loads On and Off.

When the unit enters the Remote Control Mode, the Refrigerate LED blinks at 1 sec. intervals and the Mix Out and Status LEDs are all off indicating that no load is selected. You cannot access any other Service Modes if any loads are selected.

Select the load to be controlled by repeatedly pressing the REFRIGERATE Button to obtain the proper LED pattern shown in Figure 44 for the load being tested.

Once the load is selected, the CLEAN Button becomes an ON/OFF Button for the load and the FREEZE Button has no functionality. There is a seven second automatic time-out on all loads.

MIX OUT ●	STATUS 2 ●	STATUS 3 ●	No Selection
MIX OUT ○	STATUS 2 ●	STATUS 3 ●	Barrel Motor
MIX OUT ●	STATUS 2 ○	STATUS 3 ●	Product Bowl Motor
MIX OUT ●	STATUS 2 ●	STATUS 3 ○	Barrel LLS
MIX OUT ○	STATUS 2 ○	STATUS 3 ●	Product Bowl LLS
MIX OUT ○	STATUS 2 ●	STATUS 3 ○	Compressor & Condenser Fan

○ ON
● OFF

Figure 44. Remote Control Status LEDs

PADDLE MOTOR REPLACEMENT

There are two paddle motors located at the top of the unit. These paddle motors are located under the Product Bowl. They are accessed from the top of the unit when the Product Bowl is removed. To replace a paddle motor, perform the procedure in Table 19.

Table 19.

Step	Procedure
1	Empty any product from the product bowl.
2	Disconnect power from the unit.
3	Remove the product bowl and paddles from the top of the unit.
4	Remove the left side panel from the unit.
5	Remove the control board cover by loosening the mounting screws, from each side of the cover and lifting the cover off the two tabs at the top, as shown in Figure 36.
6	Disconnect the paddle motor by disconnecting the motor leads from the connectors located near the control board on the left side of the unit, shown in Figure 45.
7	Remove the two screws holding the paddle motor cover onto the top of the unit, as shown in Figure 46.
8	Pull the motor out the top of the unit, as shown in Figure 47. There are no mounting screws holding the motor.
9	Replace the motor.
10	Place the paddle motor cover over the motor and reinstall the two screws that hold the cover down.
11	Reconnect the paddle motor leads to the connectors located at the bottom of the control board, as shown in Figure 45.
12	Replace the control board cover and tighten the two retaining screws.
13	Reinstall the left side panel onto the unit.
14	Replace the product bowl and paddles on the top of the unit.
15	Reconnect power to the unit.
16	Press the CLEAN Button to place the unit in Clean Mode and verify paddle operation.

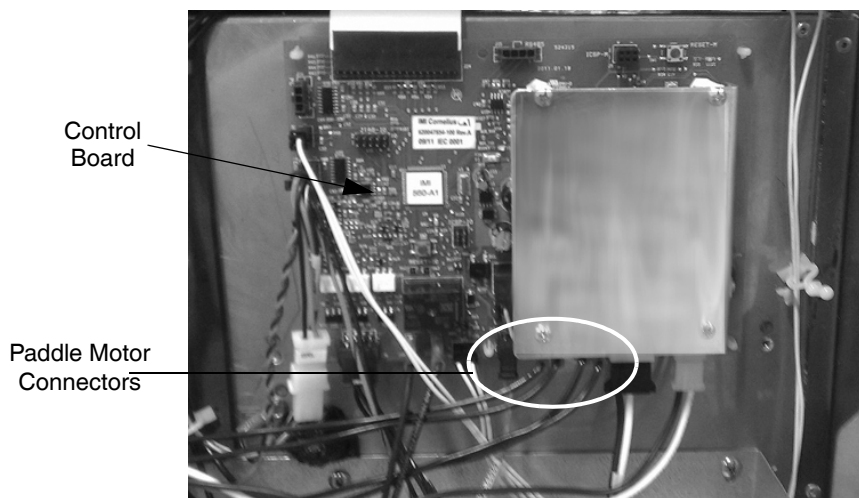


Figure 45. Paddle Motor Connectors

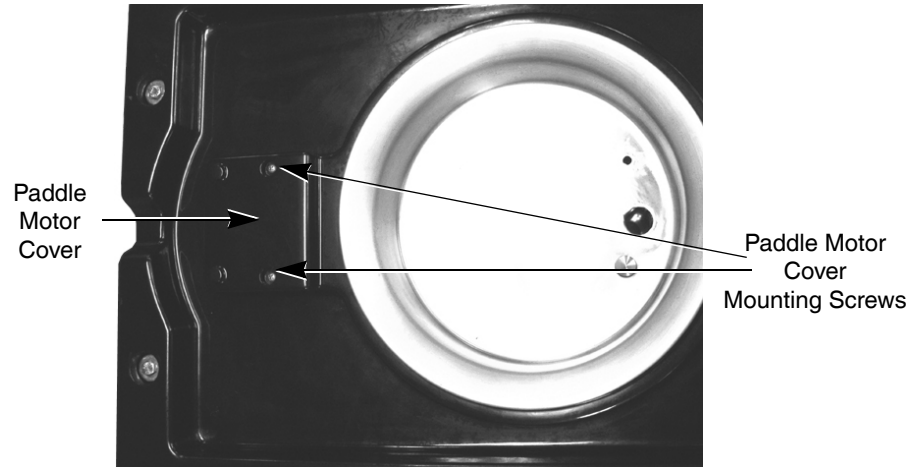


Figure 46. Paddle Motor Cover Screws

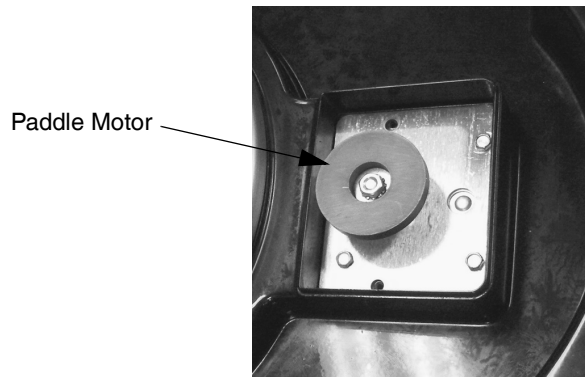


Figure 47. Paddle Motor Location

CONDENSER FAN MOTOR REPLACEMENT

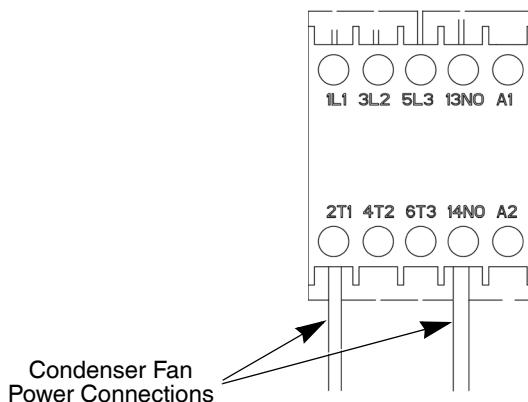
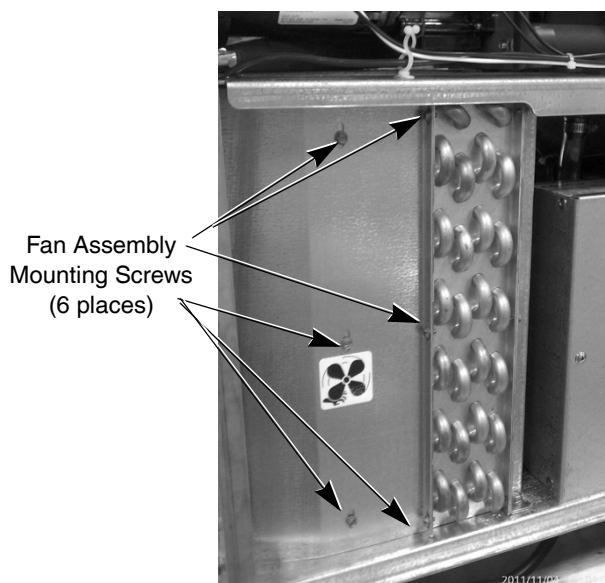
The fan motor is located in the rear of the unit, as shown in Figure 48. If the motor needs replacement, perform the procedure in Table 20 to remove and reinstall a new fan motor assembly.



Figure 48. Rear View of Unit (230VAC/50Hz)

Table 20.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the left side panel from the unit.
3	Remove the cover from the E-Box (See Figure 54 on page 38).
4	Disconnect the fan power from the contactor in the E-Box, terminals 2T1 and 14NO. (See Figure 49)
5	Remove the six mounting screws securing the fan shroud, on the left side, as shown in Figure 50.
6	Remove the fan shroud from the unit.
7	Pull the motor power wire through the machine grommets.
8	Remove the four screws under the rear of the unit that are holding the fan bracket and fan in place, as shown in Figure 51.
9	Slide the air baffle forward and the fan past the fan baffle to remove it from the unit.
10	Remove the four mounting screws holding the fan to the bracket.
11	Reverse the procedure to install the new motor and replace the side panels.
12	Reconnect power to the unit.

**Figure 49. Fan Power Terminal****Figure 50. Condenser Fan Mounting Screws**

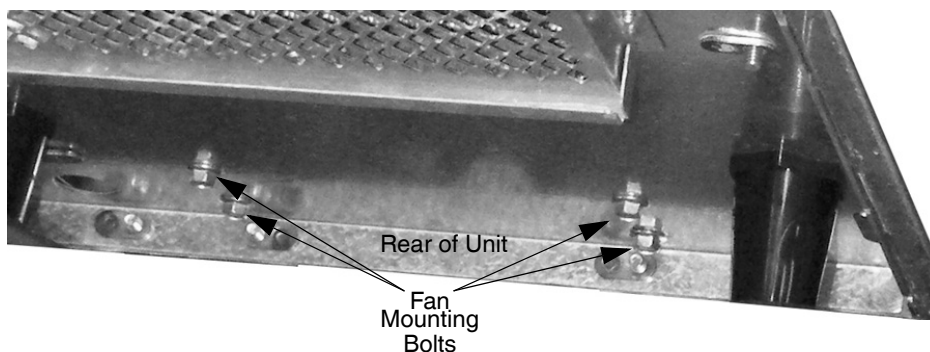


Figure 51. View of Bottom Fan Mounting Bolts

COMPRESSOR REPLACEMENT



WARNING:

Only trained and certified electrical, plumbing and refrigeration technicians should service this unit.

ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.

To replace a compressor, perform the procedure in Table 21.

NOTE: Be sure to reclaim refrigerant when replacing compressor.

Table 21.

Step	Procedure
1	Disconnect power to the unit.
2	Remove the side panels from the unit.
3	Label and disconnect all wires from the compressor.
4	Reclaim the refrigerant from the system.
5	Remove all insulation from around fittings.
6	Unsweat the suction and discharge lines from the compressor.
7	Remove the four (4) mounting bolts from the base of the compressor.
8	Remove the compressor.
9	Reverse the procedure to install the new compressor. (Tighten the 5/16-18 bolts to 132 in-lbs.)
10	Replace the dryer.
11	Replace all insulation around fittings.
12	Evacuate the system and recharge it according to the Cornelius nameplate on the unit.
13	Replace the side panels.
14	Reconnect power to the unit and test the unit.

LIQUID LINE SOLENOID/VALVE REPLACEMENT

The liquid line valves and solenoids, shown in Figure 52, are located near the center of the unit on the right side. A liquid line valve and the associated solenoid may be replaced separately. When a liquid line valve is replaced, the dryer should be replaced at the same time. To replace just the solenoid coil, perform the procedure in Table 22. Perform the procedure in Table 23 to replace the liquid line valve.

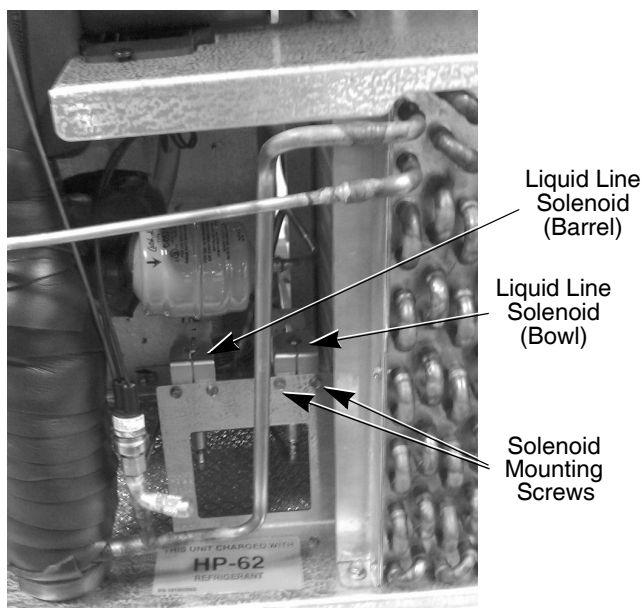


Figure 52. Liquid Line Solenoids

Table 22.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the right side panel from the unit.
3	Unplug the connector from the solenoid being replaced.
4	Remove the two mounting screws holding the solenoid to the mounting bracket. (See Figure 52.)
5	Disconnect the solenoid from the valve body by carefully pulling straight up on the solenoid while holding the valve with the other hand.
6	Snap a new solenoid onto the valve body.
7	Replace the two mounting screws.
8	Replace the connector.
9	Replace the side panel.
10	Reconnect power to the unit.

Table 23.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the side panels from the unit.
3	Reclaim refrigerant from the system.
4	Remove the solenoid coil, as described in Table 22.
5	Remove the liquid line valve.
6	Replace the liquid line valve.
7	Replace the dryer.

Table 23.

Step	Procedure
8	Evacuate the system and recharge it according to the Cornelius nameplate on the unit.
9	Verify proper system operation.
10	Replace the side panels.
11	Reconnect power to the unit.

HIGH PRESSURE SWITCH REPLACEMENT

The high pressure switch, shown in Figure 53, is located near the front of the unit on the right side. There is a Schrader valve in the fitting that the switch mounts to. Use caution so that no refrigerant charge is lost during replacement. To replace the high pressure switch, perform the procedure in Table 24.

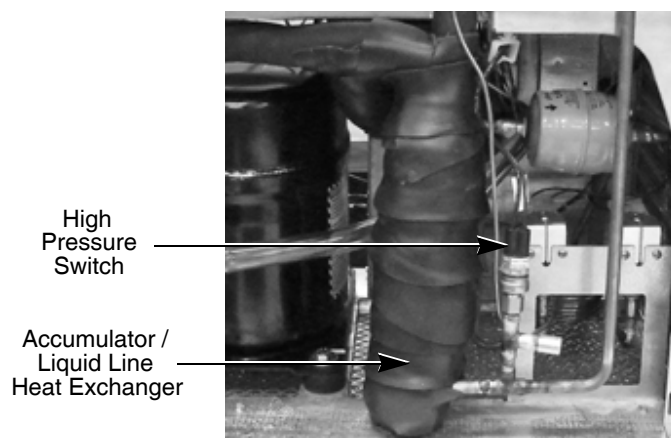


Figure 53. High Pressure Switch Location

Table 24.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the side panels from the unit.
3	Remove the protective cover from the control board by loosening the mounting screws from each side of the cover and lifting the cover off the two tabs at the top, as shown in Figure 36 on page 27.
4	Disconnect the switch wiring from the control board.
5	Remove the high pressure switch.
6	Replace the high pressure switch. Ensure that the new switch is fully seated so the Schrader valve is depressed properly. (If valve is not opened properly, the pressure switch does not sense pressure properly.) DO NOT use gaskets between the switch and the housing.
7	Reconnect the switch wiring to the control board.
8	Replace the protective cover on the control board.
9	Replace the side panels.
10	Reconnect power to the unit.

CONTACTOR REPLACEMENT

The contactor is located in the E-Box on the left side of the unit, as shown in Figure 58 on page 41. To replace the contactor, perform the procedure in Table 25.

Table 25.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the left side cover.
3	Remove the two screws from the E-Box cover (Figure 54) and remove the cover.
4	Label and disconnect the wires from the contactor.
5	Loosen the mounting screws holding the contactor.
6	Replace the contactor.
7	Reverse the procedure to install the new contactor.
8	Replace the E-Box cover and the left side cover.
9	Reconnect power to the unit.

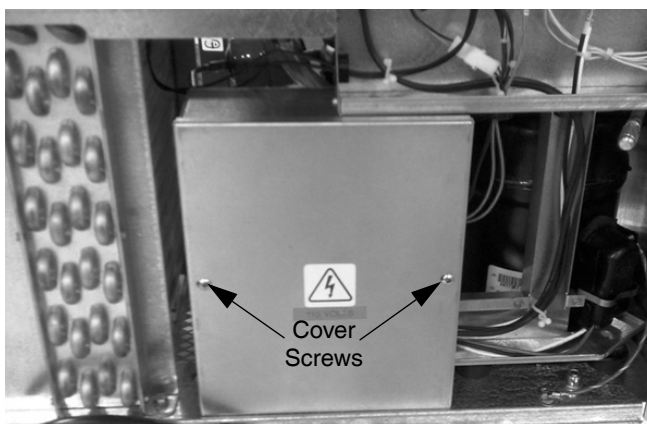


Figure 54. E-Box Cover Screws

AC POWER CABLE REPLACEMENT

All units are shipped with a power cord terminated with the proper AC plug for the application. All units are connected to AC power by plugging the electric cord plug into the proper wall outlet.

AC Cable Replacement for 120VAC Units

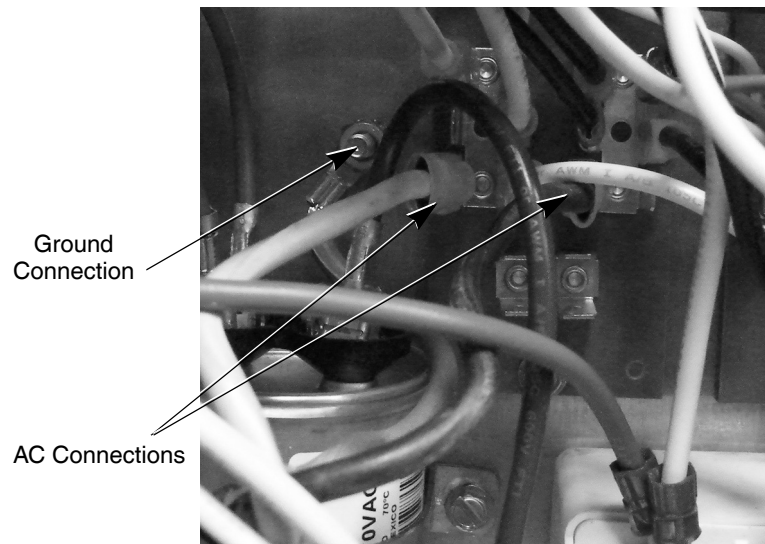
If a power cord becomes frayed or damaged, the following procedures may be used to replace the cord. Perform the procedure in Table 26 and refer to Figure 55 for 120VAC units. This procedure should only be performed by qualified personnel.

Table 26.

Step	Procedure
1	Remove the left side panel from the unit.
2	Remove the two screws holding the E-Box cover on. (See Figure 54.)

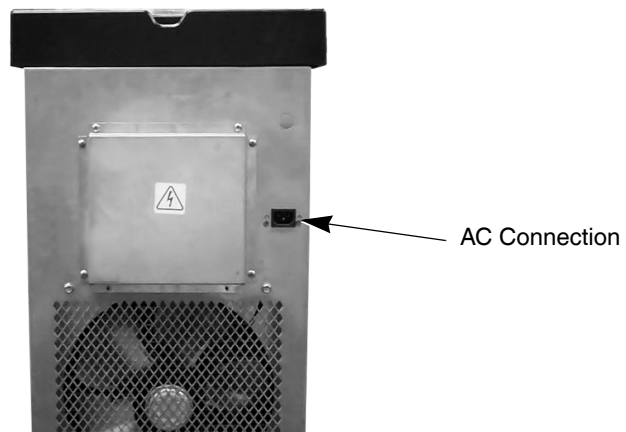
Table 26.

Step	Procedure
3	Disconnect the AC and Ground connections to the E-Box terminals. (See Figure 55.)
4	Remove the strain relief and route the cable down through the unit.
5	Replace the cable with new wiring. (be sure strain relief is properly seated)
6	Route the new wiring from the bottom of the unit following the old wiring path.
7	Connect the new wiring to the proper terminals in the E-Box.
8	Connect the wiring to the protected circuit or plug the plug into the proper receptacle. Verify the proper operating voltage before connecting the unit.


Figure 55. 120VAC Power Connections

AC Cable Replacement for 230VAC Units

If a power cord becomes frayed or damaged, it may be replaced by simply pulling it out of the power entry module connector and replacing it with a new cord, as shown in Figure 56.


Figure 56. Rear View of Unit Showing 230VAC/50 Hz Connection

Power Entry Module Replacement for 230VAC Units

Table 27

Step	Procedure
1	Remove the left side panel from the unit.
2	Locate the filter assembly mounted to the rear panel, as shown in Figure 57.
3	Label and disconnect the AC connections to the rear of the filter. (See Figure 57.)
4	Compress the spring tabs on the top and bottom of the filter and push it out the rear of the unit.
5	Install the new filter through the rear of the unit.
6	Connect the wires back to their proper locations on the new filter.
7	Replace the side panel.
8	Reconnect power to the unit.

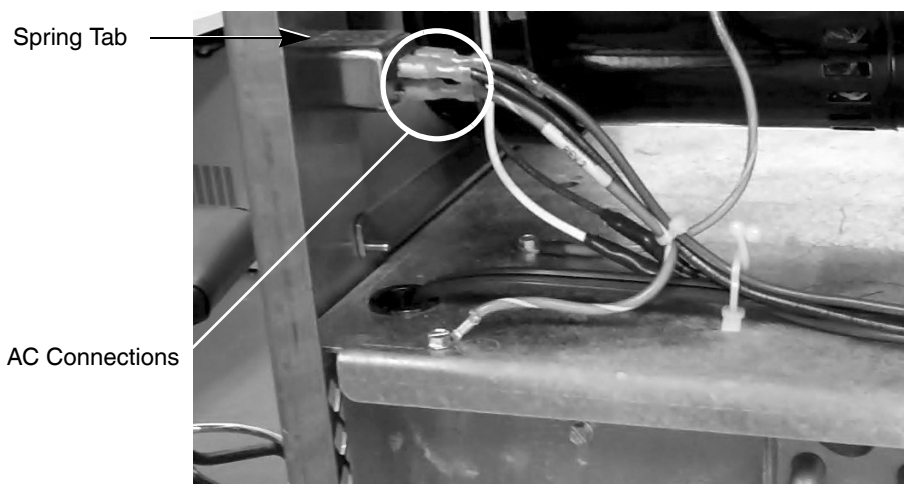


Figure 57. AC Filter Connections

COMPRESSOR CAPACITOR REPLACEMENT

The compressor start and run capacitors, shown in Figure 58, are mounted in the E-Box on the left side of the unit. To replace a capacitor, perform the procedure in Table 28.

Table 28.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the left side cover and the E-Box cover.
3	Disconnect the harness from the defective capacitor.
4	Loosen the mounting screw on the strap holding the capacitors.
5	Replace the capacitor.
6	Reverse the procedure to install the new capacitor. Make sure the labels on the capacitors are readable after replacement.
7	Replace the E-Box cover and the left side panel.
8	Reconnect power to the unit.

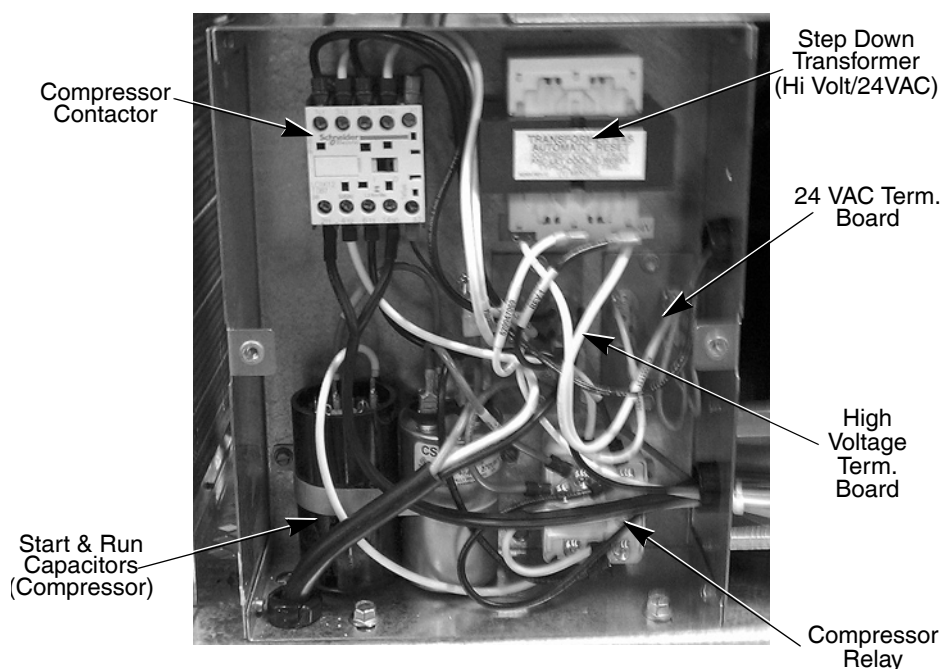


Figure 58. E-Box Components for 120V Unit

COMPRESSOR RELAY REPLACEMENT

The compressor relay, shown in Figure 58, is mounted in the E-Box on the left side of the unit. To replace a compressor relay, perform the procedure in Table 29.

Table 29.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the left side cover and the E-Box cover.
3	Label and disconnect the wires from the defective relay.
4	Loosen the mounting screw holding the relay.
5	Replace the defective relay, observing the proper orientation of the relay.
6	Reverse the procedure to install the new relay.
7	Replace the E-Box cover and the left side panel.
8	Reconnect power to the unit.

CONTROL KEYPAD REPLACEMENT

The Control keypad is a membrane switch panel that contains all of the switches controlling the Signature unit. If the panel requires replacement, perform the procedure in Table 30.

Table 30.

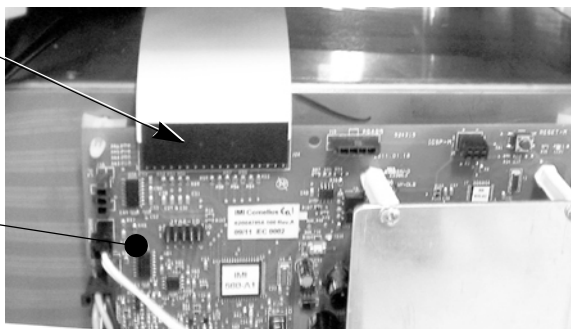
Step	Procedure
1	Disconnect power from the unit.
2	Connect a static strap to your wrist and any convenient chassis ground on the unit.

Table 30.

Step	Procedure
3	Remove the left side panel from the unit.
4	Remove the control board cover and unplug the control panel ribbon cable from the top of the board. (See Figure 59.)
5	Peel the keypad overlay from its bezel. Use a blade (knife or small screwdriver) to lift the edge of the panel.
6	Remove the keypad from the unit.
7	Slide the ribbon cable from the new keypad through the bezel and route it to the control board.
8	Peel the protective backing off of the keypad. Carefully and firmly press the keypad into place on the bezel. Make sure the keypad is properly aligned with the bezel before pressing it into place.
9	Connect the ribbon cable to the control board.
10	Re-install the control board cover.
11	Re-install the left side panel on the unit.
12	Re-connect power to the unit.

Control Panel
Connector

Control Board

**Figure 59. Control Board w/Cover Removed**

THERMISTOR REPLACEMENT

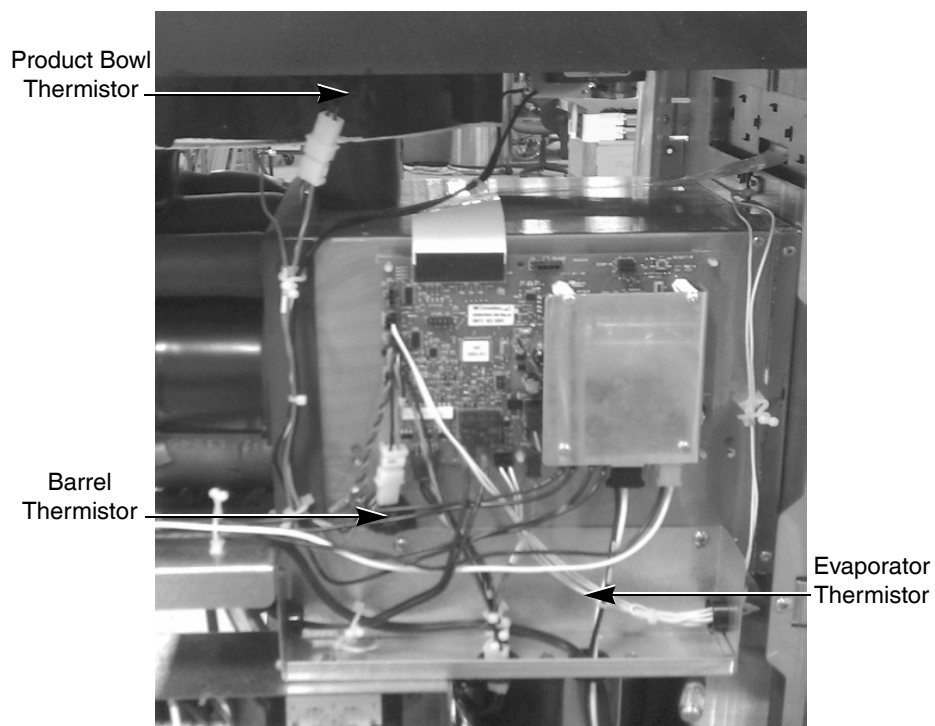
There are three thermistors used in the Signature unit. They monitor the Product Bowl, the Barrel and the Barrel Evaporator temperatures. To replace the thermistors, perform the procedure in Table 31.

Table 31.

Step	Procedure
1	Disconnect power from the unit.
2	Remove the left side panel from the unit.
3	Locate the thermistor being replaced. (See Figure 60.)
4	Disconnect the thermistor from the circuit by unplugging it from the connector.
5	Remove the thermistor by pulling it out of its sheath. (Product Bowl and Barrel only.) For the Evaporator thermistor the insulation must be removed before the thermistor can be accessed.
6	Verify the color coding and the tags on the new thermistor. (Orn/Wht - Product Bowl, Orn - Barrel, Orn/Blk - Evaporator)
7	Coat the new thermistor with thermal conductive grease.
8	Install the new thermistor (push the thermistor in until it bottoms out).

Table 31.

Step	Procedure
9	If insulation was removed, make sure it is replaced properly.
10	Reconnect the thermistor to the proper connector.
11	Replace the left side panel.
12	Reconnect power to the unit.


Figure 60. Thermistor Locations

TROUBLESHOOTING

TROUBLESHOOTING - CONTROLS

Problem	Probable Cause	Remedy
No activity at all	A. Unit unplugged / cable disconnected B. No power to branch circuit. C. Keypad bad or disconnected. D. Control Board bad.	A. Make sure unit is plugged in and cord is connected in E-box B. Make sure fuse is good/installed or breaker is switched to "ON". C. Check for proper connection/replace keypad D. Replace Control Board
Front panel LEDs indicate unit on but no motor activity/will not respond	A. Software detected error condition B. 24VAC missing C. Bad or missing cable connection D. Control Board bad	A. See error table page 9. B. Check that faceplate is in proper mounted position and adjust as needed Check for excessive refrigeration pressure and correct Check connections and transformer in E-box and correct C. Connect or replace cable. D. Replace Control Board
No condenser fan or compressor	A. Software detected error condition B. Bad contactor or connections	A. See error table document B. Check connections, contactor and transformer in E-box and correct
No condenser fan but compressor runs	A. Bad connections B. Bad condenser fan C. Bad contactor	A. Check connections at contactor and fan and correct B. Replace C. Replace
No compressor but condenser fan runs	A. Bad connections B. Bad start relay C. Bad capacitor(s) D. Bad compressor E. Bad contactor	A. Check connections at contactor, capacitors, start relay and compressor and correct B. Replace C. Replace D. Replace E. Replace
Product Bowl blades do not turn	A. Blades uncoupled from drive B. Bad / missing connections to hopper motor C. Control Board bad D. Bad Product Bowl motor	A. Check that hopper product viscosity is within limits & correct as necessary B. Check connections & correct as necessary C. Replace Control Board D. Replace motor
Product does not dispense	A. Motor does not turn B. Bad connections to dispense switch C. Dispense switch bad or mis-located D. Control Board bad	A. See next section B. Check connections / correct as needed C. Adjust/replace as needed D. Replace board
Motor does not turn at all	A. Face plate not in proper position or missing B. Product frozen solid C. Software detected error condition D. Bad connections. E. Faceplate switch bad or mis-located F. Control Board bad	A. Verify face plate is secure and in proper position for unit operation B. Clean out barrel and check that viscosity settings are correct for current product C. See error table document D. Check connections between E-Box, control board and correct as needed. E. Adjust or replace faceplate F. Replace

TROUBLESHOOTING PRODUCT NOT COLD

Problem	Probable Cause	Remedy
Compressor not Running	<ul style="list-style-type: none"> A. Barrel not in Freeze or Refrigerate mode. B. No voltage to compressor. C. Bad start components. D. Compressor's thermal overload protector "open". E. Open or shorted compressor windings. F. Bad Control Board. 	<ul style="list-style-type: none"> A. Select Freeze or Refrigerate. B. Check power at contactor L2 - L3, T2 - T3. C. Check components and wiring. D. Check resistance of compressor windings and check incoming line voltage. E. Check resistance of compressor windings. F. Troubleshoot, replace if necessary.
Compressor Running but not Cooling	<ul style="list-style-type: none"> A. Low refrigerant. B. Restricted condenser/filter. C. Condenser fan motor/blade defective. D. Liquid Line valves not operating. E. Defective compressor. 	<ul style="list-style-type: none"> A. Repair leak and weigh in new charge. B. Clean or repair. C. Repair or replace. D. Check cables and connections to control board and repair or replace. E. Repair or replace.
Restricted Air Flow	<ul style="list-style-type: none"> A. Dirty filter. B. Dirty condenser. C. Damaged fins. D. Not enough "clearance" around unit. 	<ul style="list-style-type: none"> A. Clean filter. B. Clean condenser. C. Repair/replace if necessary. D. Ensure proper spacing around unit.
Fan Motor not operating properly	<ul style="list-style-type: none"> A. Bad connection B. Bad motor C. Cracked or bent fan blade 	<ul style="list-style-type: none"> A. Check/connect B. Replace motor C. Replace fan blade
Liquid Line Valves not operating	<ul style="list-style-type: none"> A. Miswired. B. Defective coil. C. Valve mechanically bad. D. Defective control board or transformer. 	<ul style="list-style-type: none"> A. Correct wiring. B. Replace coil. C. Replace valve. D. Check and replace.
No/Low Refrigerant	<ul style="list-style-type: none"> A. Leak. 	<ul style="list-style-type: none"> A. Repair and weigh in new charge.
Thermistors/Reed Switches	<ul style="list-style-type: none"> A. Bad connection. B. Bad sensor. C. Sensor out of position. D. Defective control board. 	<ul style="list-style-type: none"> A. Correct wiring. B. Replace sensor. C. Reposition sensor and clip. D. Replace.

WIRING DIAGRAM

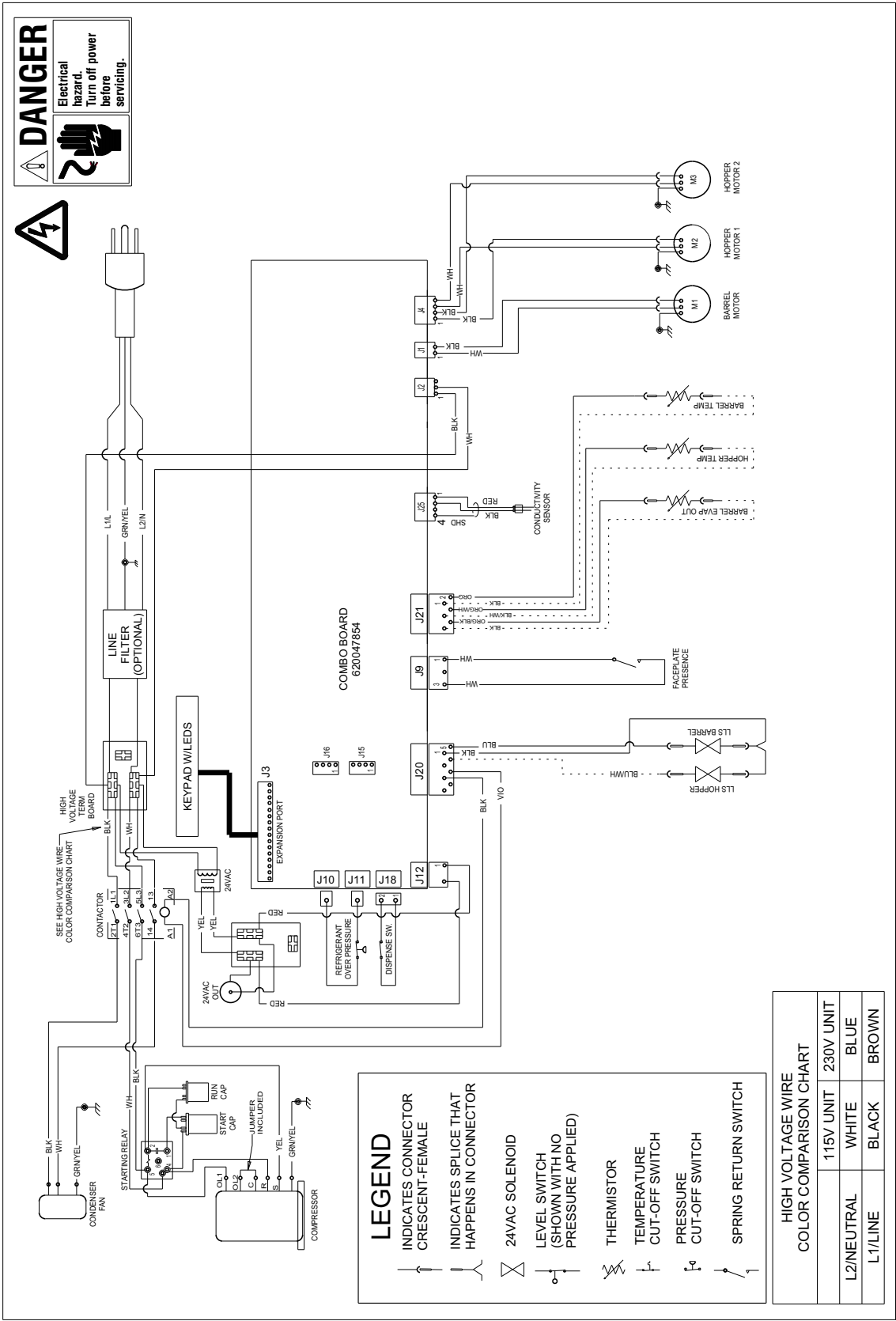


Figure 57. Wiring Diagram

REFRIGERATION DIAGRAM

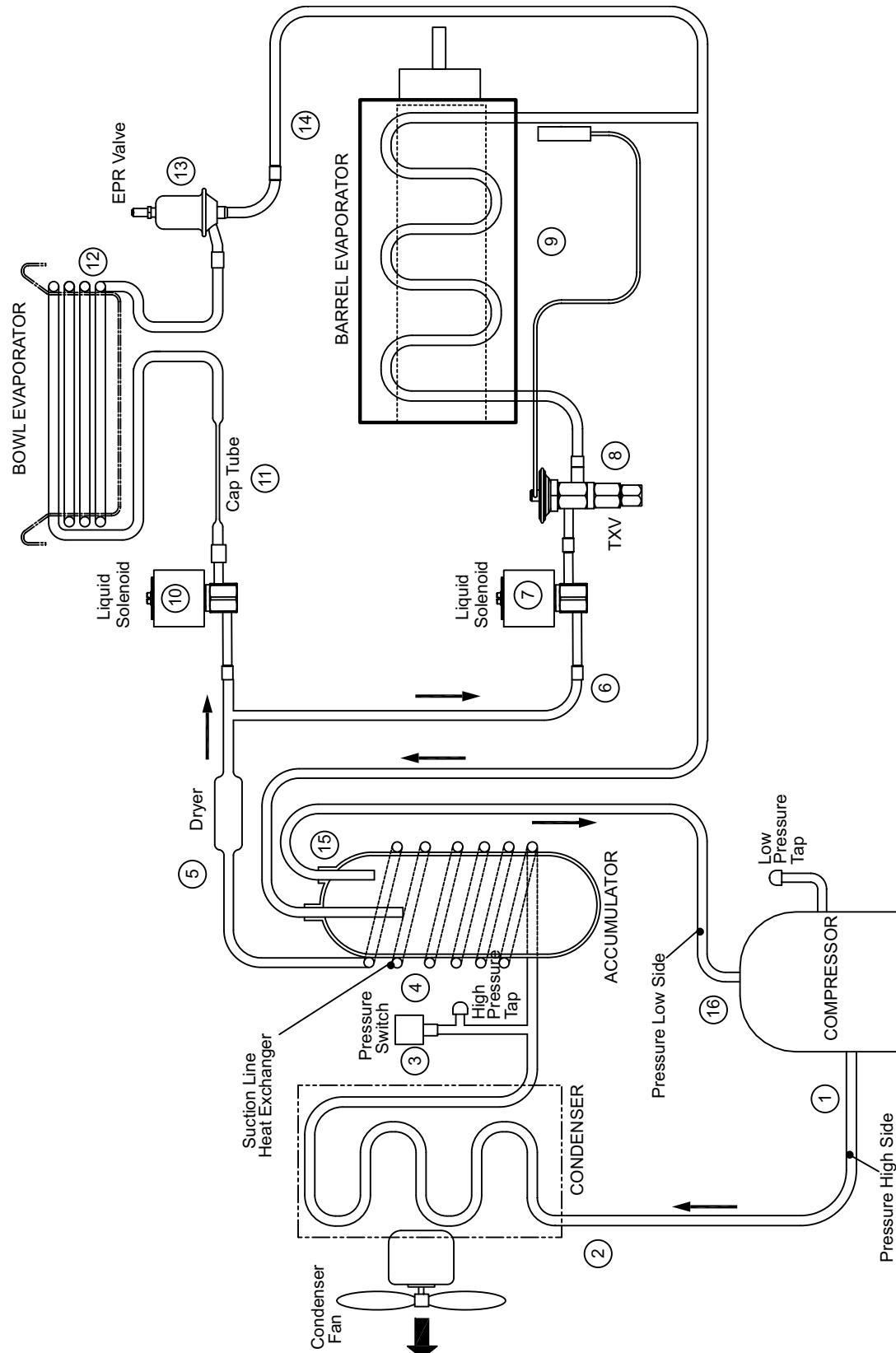


Figure 57. Refrigeration Diagram

SPECIFICATIONS

Line Voltage:	115VAC +10%, -15% (60 Hz.)
.....	230VAC +10%, -15% (50 Hz.)
Max. Current Draw (FLA):	16 A., 2549 W. (115V)
.....	8 A., 2549 W. (230V)
Ventilation Clearance	3 in. (8 cm) on back
.....	Open to ceiling
.....	0 in. (0 cm) on sides of unit
Equipment Weight (empty):	225 lbs. (102 kg)
Approx. Product Weight:	36.48 lbs. (16.56kg)
Product Bowl Capacity:	3 Gal. (11.4 liters)
Chamber Capacity:	1 Gal. (3.8 liters)
Height (to the top of the Bowl Cover) (including 4 in. legs):	35 in. (89 cm)
Clearance required for product fill: (Open to ceiling)	additional 12 in. (30 cm)
Width:	15-1/2 in. (39 cm)
Depth (including drip tray):	34 in. (86 cm)
Operating Temperature:	55 to 105° F (13 to 40.5° C)
Refrigeration Type:	404A
Compressor Type:	¾ hp reciprocating
Refrigerant Charge:	20 oz. (567 g)
System Pressures:	Barrel ~250 PSIG (17.6 kg/cm ²) High side
.....	and ~45 PSIG (3.2 kg/cm ²) Low side
.....	Bowl ~200 PSIG (14.0 kg/cm ²) High side
.....	and ~33 PSIG (2.3 kg/cm ²) Low side
.....	System pressures are measured at 75° F. (24° C) ambient
Bowl Temperatures:	Maintains <41° F (5° C)
Barrel Freeze Time	
.....	approx. 10 min. @ 75° F (24° C) ambient w/65° F (18° C) product from bowl

Cornelius Inc.
www.cornelius.com